

SuperplanTM

SPREADSHEET
TIME MANAGEMENT
BUSINESS GRAPHICS

USER GUIDE



Precision
Software

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PREFACE

This book is a complete introduction, user's guide and reference manual for Superplan. It is intended for all users, from those who only need Superplan occasionally for relatively simple tasks to those who need to develop sophisticated applications and use them continually. Its aim is to give the reader all the information required to use Superplan.

The documentation for Superplan forms an integrated whole:

Introduction	A brief introduction to the main features of Superplan and its operating principles.
User's Guide	A comprehensive reference manual for the entire Superplan package.
Quick Reference	A summary of Superplan designed for users who are already familiar with its operation (this can be found in the envelope at the back of the book).
Using Superplan for the First Time	Instructions telling you how to install Superplan on your machine (these can be found in the envelope at the back of the book).
On-line Help	Screens of information that you can ask for if you are unsure about what to do next.

The books start with an introduction to Superplan, which gives you an opportunity to use some of the basic Superplan operations and introduces you to the wide range of powerful Superplan features. It also shows you how to find out more about Superplan from the remaining chapters and other sources of information.

The User's Guide is divided into six chapters. Chapter 1 contains basic information about using the worksheet. Chapters 2, 3 and 4 contain more specialised information about the timesheet, database and graphics. Where possible, each topic starts on a separate page to help you find it quickly.

Chapter 5 gives brief descriptions of some typical Superplan examples which are supplied with Superplan. They are designed to give you an insight into how you can use Superplan for your own particular application. Chapter 6 describes the Superplan programming facilities and explains how you can customise Superplan for your own applications.

At the end of the guide there is an appendix of error messages, followed by a glossary explaining any unfamiliar terms, and an alphabetical index to the entire guide.

There are many examples throughout the guide. Where possible, they are shown in the form they appear on your computer screen. Data to be typed by you is given on separate lines.

Although this guide is designed to give you all the information you need to use Superplan, undoubtedly the best way of seeing what Superplan can do for you is to try it out for yourself. So feel free to experiment, and invent examples of your own. The more you use Superplan, the clearer you will see how it can help you.

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WHAT IS SUPERPLAN?

Superplan adds the all-important feature of time management to spreadsheet, database and graphics capabilities to provide a versatile, powerful and easy to use planning and decision aid.

It allows you to create a 'computerised wall planner' for allocating your resources to different tasks over periods of time. Everything happens on a 1024 column by 2048 row worksheet, with a cell at each intersection of a column and row. In these cells you can place information or commands, or perform calculations.

In one part of the worksheet you can keep your database: all the basic information about your business that you need for effective management.

In another part you can develop your timesheet, using the information stored in your database to help you allocate resources to jobs over periods of time.

In other areas of the worksheet you can perform complex numerical calculations on your database and timesheet data, using powerful mathematical and logical functions.

Because all your data and commands share the worksheet, you can integrate them in ways that accurately reflect the complex inter-dependent nature of your business. Once you have set up your initial worksheet, you can use the relationships between the items of data to see what effect different changes in your business will have.

SUPERPLAN AS A MANAGEMENT TOOL

Some of the many uses of Superplan include:

- Planning and costing staff assignments
- Planning and costing the stages of a product launch
- Planning and costing a construction project
- Scheduling production in a factory
- Planning hotel room allocation
- Assigning work to maintenance teams
- Planning and costing machine allocation
- Planning warehouse space allocation
- Performing cash flow projections
- Estimating job costs
- Projecting sales
- Making OHP presentations
- Keeping records

SUPERPLAN AS A DECISION AID

Superplan does not make decisions for you. Instead it provides you with a quick and easy method of demonstrating what effect certain decisions will have. You can use it to help you answer such questions as:

- How long will this job take? How many people will I need? What will happen if I use fewer people?
- Which machines should I allocate to which jobs? How can I make the best use of them?
- What will be the day-to-day costs on this project? Is there any way in which I can reduce them?
- Can I afford to buy a new piece of equipment? What will happen to my cash flow if I do?

USING SUPERPLAN

Superplan is very easy to operate. You don't have to be a computer expert, nor do you need to memorise long and complicated instructions.

Operations are simple and straightforward. At every stage, Superplan tells you where you are and what you are doing.

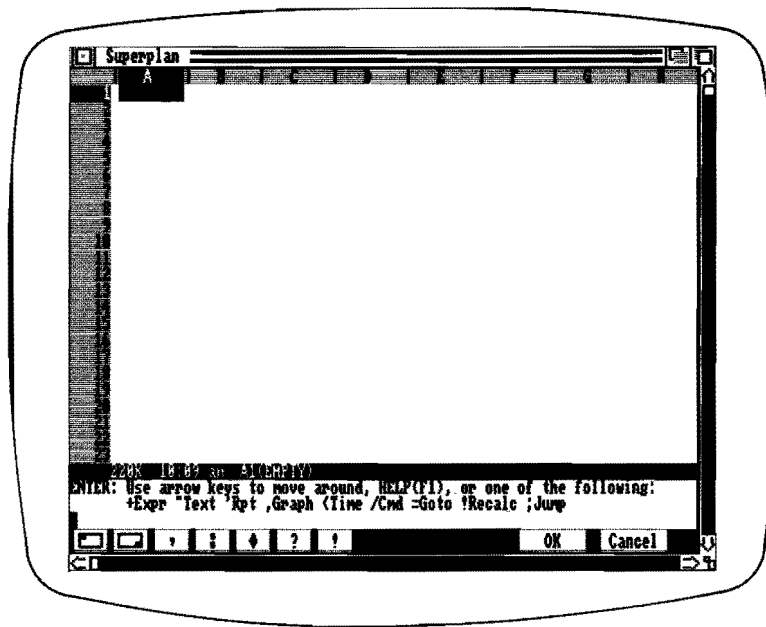
Instructions to Superplan are usually presented to you in the form of a short list of single-word options, from which you select the one you require. Superplan even gives you a brief explanation of each option.

At any point you can ask for more information by pressing the F1 HELP key; this overlays the worksheet with one or more pages of information relating directly to the operation you are trying to perform. As you become familiar with Superplan you will find that you can enter commands all in one go, without needing to look at the different options or help screens.

GETTING STARTED

If this is the first time you have used Superplan, read 'Using Superplan for the First Time' in the pocket at the back of this book. Otherwise, simply follow the instructions below.

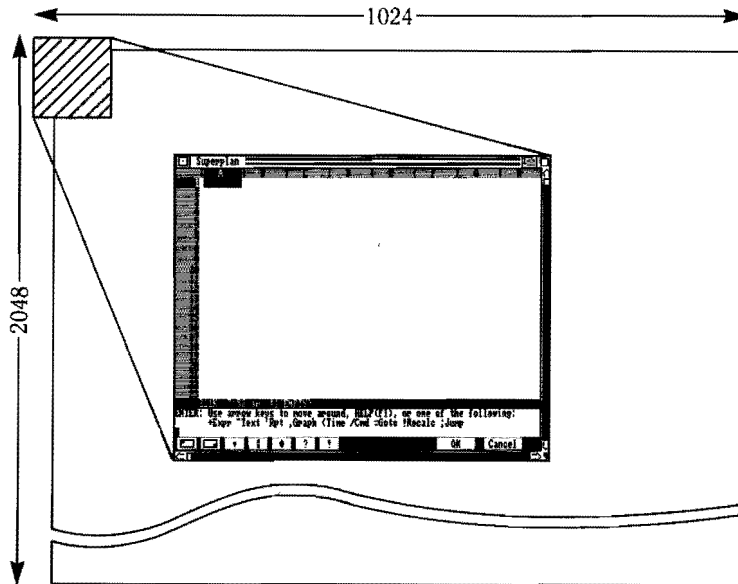
1. Switch on your computer, load the Amiga Workbench and put the Superplan disk in any drive.
2. Double click on the Superplan disk icon.
3. When the Superplan disk window has opened, double click on the Superplan program icon.
4. The program loads and, after a short pause, the Superplan copyright notice is displayed, followed by a blank worksheet:



THE WORKSHEET

The Superplan worksheet is a grid of cells, each cell being formed by the intersection of a row and a column. There are 2048 rows and 1024 columns.

With a worksheet so large, it is impossible for your computer to show all of it at the same time, so Superplan only shows you the part you are using. Since you have not entered anything yet, it shows you the top left-hand corner.



Each cell on the worksheet is a slot into which you can enter different kinds of information, such as words, dates, labels, numbers, commands, jobs, or formulae for calculating numbers. To see how it works, type:

Example_

(From now on, _ will be used to tell you to press the _ or Enter or Return key.)

Notice how the characters appear on the bottom line of the screen: the entry line. For the time being, don't worry about the three lines above it (the status, prompt and help lines); they will be explained later.

It doesn't matter if you make a mistake, but if you notice one before you press _ , just press the BACKSPACE key until you reach the mistake, then type the entry correctly.

When you press **↵**, Superplan moves the word from the entry line to the top left-hand cell of the worksheet, cell A1.

The highlighting over cell A1 (the cell cursor) shows you in which cell Superplan will put your next entry. So, if you type something else now, it will be displayed in cell A1 and will overwrite the word that is already there.

So to enter something in another cell, you must move the cell cursor. To do this, press the **→** key.

The cursor moves one cell to the right, to cell B1. The fourth line from the bottom (the status line) displays:

B1(EMPTY)

indicating that the cursor is now on cell B1 and that the cell is empty.

If you press the **←** key, the cursor moves back to cell A1 and the status line displays:

A1(TEXT) = EXAMPLE

indicating that cell A1 contains text and that the piece of text is 'Example'.

To move the cursor to cell A2, press the **↓** key. To move it back to A1, press **↑** key.

Using the four arrow keys, you are now able to move the cursor to any cell on the worksheet.

Move the cursor to cell B1 and enter:

123↵

When you press **↵**, Superplan moves the number to cell B1 and the status line indicates that B1 now contains a number (NMBR).

You have now entered a piece of text and a number and used the arrow keys to move around the worksheet. If you look carefully at the second and third lines from the bottom of the screen (the prompt and help lines), you can see that these are three of the options available:

Arrow keys to move around

"Text

+ Expr

('Expr' is short for Expression and in Superplan a number is treated as a kind of expression)

In the rest of this chapter you will use some of the other options.

MORE INFORMATION

You can see more information by selecting the Superplan Help function: either press the F1 HELP key or click on the HELP button (the button containing a question mark at the bottom of the screen). Your worksheet is partially overwritten by another window containing a menu of topics on which you can get help. This is the Help window. The gadgets at the top right of the window allow you to select the next page or previous page of information, or to jump back to the first page. For details of how to use the Help window gadgets, see the section headed **The Help Window**, Chapter 1 of the User's Guide.

Click on the Close gadget at the top left corner of the window or press the Esc key, to remove the Help window. To see the first page of General help, simply press **_J** or click on Next Page gadget (the down arrow) at the top right of the Help window. The second general help page lists all the options now available. The third, fourth and fifth pages describe different ways of moving the cell cursor.

Some of the information on these pages you will not understand at this stage, but read them through anyway.

When you have returned to worksheet, clear cell B1 by entering:

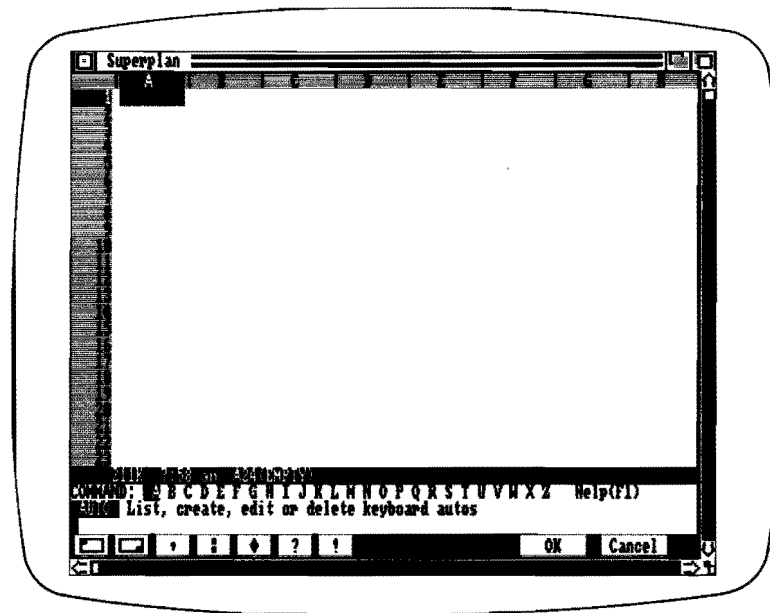
/B_J

/B is short for **/Blank** and is used to clear the contents of one or more cells. To clear cell A1, move the cursor left and enter the same thing:

/B_J

Your worksheet is now back to its original condition.

The **/Blank** command is one of the Superplan **slash commands**. To see a list of all the slash commands and brief explanation of each one press **/**.



Each character after the word COMMAND on the prompt line represents a slash command. Note that the A character is highlighted. This highlighting is called the option cursor. To see an explanation of each command, press the → or ← key to move the cursor from one character to another, and look at the help line below.

To select one of the commands, you would either move the cursor to appropriate character and press ↵, or type the character itself. When you selected the /Blank command above, you used the latter method.

Don't worry if you don't understand all the commands at this stage. For now, return to your original display by pressing the ESC key.

USING THE MOUSE

In the previous section, all the operations you carried out were controlled from the keyboard. Superplan also allows you to use the Amiga mouse instead of the keyboard. For many tasks, instead of pressing a sequence of keys you only need to position the mouse pointer and click the left mouse button.

The mouse, in combination with the Superplan menus, the scroll bars and the buttons at the bottom of the screen, provides an alternative system of control to the keyboard. You don't have to use the mouse and, if you wish, you can ignore it altogether and stick to the keyboard; but you will find that it is often quicker and easier.

Here are some of the actions that can be performed with the mouse:

- Selecting an option from one of the Superplan menus
- Positioning the cursor on the worksheet
- Selecting one of the slash commands
- Activating the control buttons at the bottom of the screen
- Scrolling the worksheet using the scroll bars

Detailed information on the mouse controls, the menus and the control buttons is given Chapter 1 of the User's Guide. In the rest of this section, we introduce some of the ways in which the mouse can act as an alternative to the keyboard.

If you worked through the example on the previous pages, the worksheet should now be blank with the cursor in the top left-hand corner.

Start by moving the mouse pointer to cell D10 and then click the left mouse button. The cursor moves from cell A1 to cell D10. Notice that the cursor movement has been achieved in one go. If you had used the cursor keys to move the cursor, you would have had to press them repeatedly. By positioning the pointer anywhere on the screen and clicking once, you are able to move the cursor to a new cell almost instantly.

Now, without pressing the $\downarrow$ key, type:

Example

To enter this piece of text in D10, move the pointer to the OK button at the bottom right of the screen and click the mouse button. As you see, clicking on the OK button has the same effect as pressing the $\downarrow$ key. Whenever Superplan requires you to press $\downarrow$, you can use this button as an alternative. Likewise, clicking on the Cancel button is equivalent to pressing the Esc key.

In this case, it would have been easier to press $\downarrow$ (since your fingers were already on the keyboard), but there are other situations where you will find clicking on the OK or Cancel buttons more convenient.

Mouse control also allows you to execute the slash commands. To see this in action, move the pointer anywhere in the prompt and help lines (the second and third lines from the bottom of the screen) and click once. The prompt line is replaced by a line of slash commands extending from A to Z. (From the keyboard, pressing the '/' key would have the same effect). You can now use the slash command /B to clear the contents of cell D10; but instead of pressing /B, as you did in the previous example, the whole operation can be carried out under mouse control.

First click on the letter B. The prompt line should look like this:

BLANK: Range (ENTER to blank current cell) [F1 for HELP]

The OK button is equivalent to the ☐ (Return or Enter) key, so clicking on this button blanks the current cell.

The last example in this section shows you how to use the scroll bars and the HOME and END buttons. Remember that the screen only shows a part of the worksheet at a time: it acts as a window on a much larger area. By using the scroll bars, you can move the screen window over the worksheet, or, to put it another way, you can scroll the worksheet past the window.

Starting with the vertical scroll bar on the right of the screen, position the pointer over the slider (the white square at the top of the scroll bar). Press the left mouse button and keep it pressed down. Then move the slider to a position about half way down the scroll bar. You will see the window has moved a long way down the worksheet and that the rows are numbered at the left of the screen in hundreds or over a thousand.

Repeat this operation using the horizontal scroll bar at the bottom of the screen. Keeping the mouse button pressed down, move the slider to a position roughly in the middle of the scroll bar.

From the column letters at the top of screen, you can see that you are now somewhere in the middle of the worksheet. For the purposes of this example, it doesn't matter where you are. The scroll bar sliders are only used for large-scale movements.

If you want more precise control, click on the arrows at the end of the bars. This action moves the window one row or column at a time. Alternatively, click outside the slider in the scroll bar to move the window a screen at a time; i.e., 8 columns horizontally or 23 rows vertically.

Another way of moving the window to a specific location, is to use the =Goto slash command (see Chapter 1 of the User's Guide).

You can now enter a number in the current cell (once again, for this example, it is not important what the cell references are). Type:

123

and press ☐ or click on the OK button.

At this stage, you have entered two pieces of data on the worksheet: the text 'Example' in cell D10 and the number 123 in another cell elsewhere in the worksheet. Despite the fact that these two cells are far apart, Superplan allows you to move rapidly from one to the other. To return the cursor to D10, first click on the HOME button. Wherever you are in the worksheet, HOME always takes you back to the initial position and places the cursor in cell A1. Cell D10 is now in view and you can move the cursor to this cell by clicking in it.

The END button moves the cursor to the last filled cell in the worksheet; i.e. the rightmost and lowest cell that contains data. So if you click on END, the screen will move back to the cell containing 123.

The next section takes you through a simple Superplan application. Before moving on it, you need to clear the worksheet of any existing data so that it is ready for loading a new file.

From the keyboard, you could do this by typing:

/zy

But to illustrate another way of using the mouse, let's see how to blank the worksheet using one of the menu options.

Hold down the right mouse button and move the pointer to the bar at the top of the screen, the menu bar. A row of headings for the six Superplan menus appears.

Move the pointer to the Project menu heading. As you do so, Superplan displays the Project menu below the heading. While still holding down the right mouse button, highlight New, which is the first option in the menu.

Notice the letters /zy at the right of the word New on the menu. These indicate that this option is the menu equivalent of the slash command /ZY (Z is short for Zap, the command used to blank the entire worksheet; Y is short for Yes and confirms that you want to proceed with the operation).

If you now select the New option by releasing the mouse button, Superplan performs the /zy slash command and blanks the worksheet. If you examine the Superplan menus, you will see that New is just one of a large number of options, most of them the equivalent of a slash command key sequence. For a list of the menus and their options, see **Superplan Menu Summary** in Chapter 1 of the User's Guide.

MORE INFORMATION

More information on the Superplan mouse controls is given in Chapter 1 of the User's Guide under the following headings: Moving the Cell Cursor, The Control Panel, Using the Mouse, The Superplan Menus, and Slash Commands from the Menus.

Note that the descriptions of the Superplan commands and controls given elsewhere in this manual only refer to the keyboard controls. This applies particularly to the examples which are given throughout the User's Guide. When you are working through the examples, you should bear in mind that some tasks may be easier to perform using the mouse controls and the menus.

A SIMPLE APPLICATION

To give you an idea of how Superplan can be used, we have prepared a very simple example for you to look at and add to. This example is in a disk file, so first you must load it onto the worksheet. Enter:

/L

then press F1 Help. As you can see, /L is short for /Load; it belongs to the same group of commands (the slash commands) as /Blank.

The first help page tells you that you must now tell Superplan what kind of file this is. So return to the worksheet and look at the prompt line.

The word Superplan is highlighted by the option cursor. The remaining words on the line are the options available at this stage, and you can use the → and ← keys to move the cursor from one line to another, just as you did with the slash commands. (Notice how the one-line explanation beneath changes, just as it did before.)

To remind you of the methods for selecting an option, you may either:

1. Move the cursor to it and press ↵, or
2. Type the first letter of the option.

These methods apply to all the options, including Help. For now, you need to load a Superplan file, so either move the cursor to **Superplan** and press ↵, or type **L**.

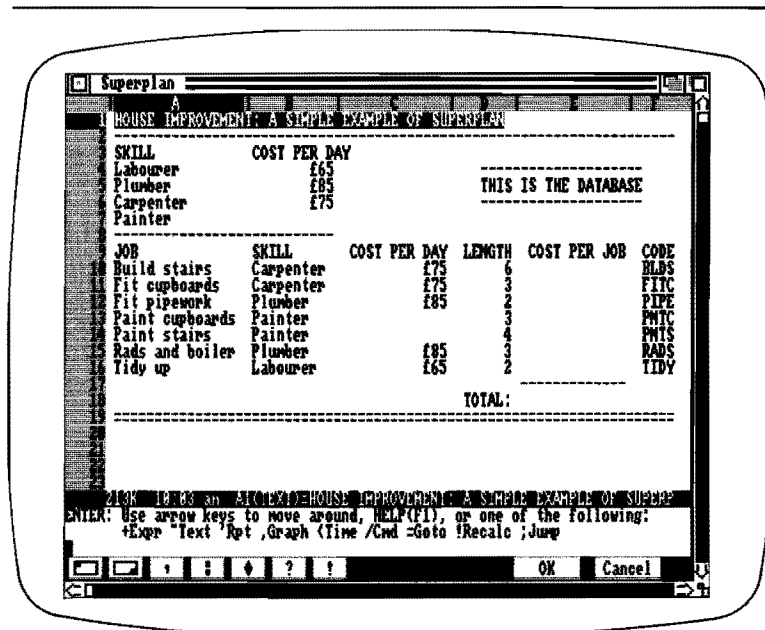
Now press the F2 FILES key, followed by ↵. This gives you a list of the Superplan files on your disk, any one of which you can load simply by highlighting it. The example is in a file called HOUSE.SPP, so use the arrow keys to highlight the filename, then press ↵.

The prompt line now displays:

LOAD: All Cells Options Help

with **All** highlighted. Since you do need all of HOUSE.SPP, simply press ↵.

Superplan asks you to wait, then almost immediately displays information about some house improvement jobs.



MORE INFORMATION

Superplan also provides commands for copying, renaming and deleting files (the /Utilities command). You can also save your worksheet on disk (the /Save command).

If you want to take a look at these commands, type /U or /S and press F1 HELP or click on the ? button. When you return to the worksheet, press ESC to cancel the command. For more detailed descriptions, see Chapter 1 of the User's Guide.

The house-improvement example shows in a very simplified form how the different jobs are defined, what skills are required, how long they will take and how much they will cost. Later you will see a timetable for the jobs and a graphical representation of the costs involved.

The example is designed to show the different elements of Superplan (the database, timesheet, spreadsheet and graphics) and how they are related to each other.

Before you look at it in detail, however, note how the widths of all the columns have been altered. Initially all the columns in the worksheet are eight characters wide, but in fact you can vary the width of each column entirely to suit the kind of data you want to display in it.

MORE INFORMATION

There are many ways in which you can vary the formatting of the cells, in addition to changing the column width. You can specify the number of decimal places to be shown, precede each number with a £ sign, enclose negative numbers in parentheses, and so on. If you have a colour monitor, you can even use different colours for different parts of the worksheet.

For a quick look at these features, enter /F for /Format, press **↵**, then press F1 HELP or click on the ? button. The help pages show the formatting options you can use. When you return to the worksheet, press ESC to cancel the /F command.

Note that the text in cell A1 runs over into adjacent. This does not mean that the adjacent cells contain the extra text; for example, if you move the cursor to cell B1, the status line tells you that B1 is empty.

Each cell can contain a large number of characters; it does not depend on the width of the cell on screen. If the adjacent cells are empty, Superplan displays the extra characters over them; if they are not empty, Superplan only displays the characters for which it has room.

A similar example of this effect is on row 2. If you move the cursor to any cell on this row, you will find that all the cells are empty except the first. A2 contains repeated text; i.e. a single character which Superplan has repeated along the entire row.

To try this out for yourself, move the cursor to cell A2; the status line displays:

A2(REPT)=-

which indicates that it contains repeated hyphens. This is another of the options on the help line:

'Rpt

To change these hyphens to equals (=) symbols, enter:

'=↵

Don't forget the apostrophe; this tells Superplan that the = symbol is not just text, but is repeated text. When you press **↵**, the row of hyphens is replaced by a row of = symbols.

THE DATABASE

If you have not come across the term 'database' before, do not be intimidated by it. It is simply computer jargon for items of information arranged in a tabular form.

On your screen there are two tables: one of skills and the other of jobs. For each skill, the table shows how much the appropriate workman costs per day.

The job table below it shows what skill is required for each job and at what the daily cost, and how long the job will take (in days). There is also a code for each job (the purpose of which will become clear later) and a total cost (yet to be filled in).

All the information in the skill database has been entered directly as text or numbers. If you move the cursor from cell to cell, the status line tells you what is in each one. Cell A5, for instance, contains the text 'Plumber', while cell B5 contains the number '85'.

At the moment there is no cost for 'Painter', so to enter it, move the cursor to cell B7 and enter:

80_

Notice how the £ sign is automatically displayed: this is because these fields have been /Formatted to display the £ sign in front of every number entered.

MORE INFORMATION

For more information on entering numbers, type + then press F1 HELP or click on the ? button; the second help page tells you a little more about numbers. More detailed information is given in Chapter 1 of the User's Guide.

Now look at the COST PER DAY column in the job database. The two costs for the painter are also missing.

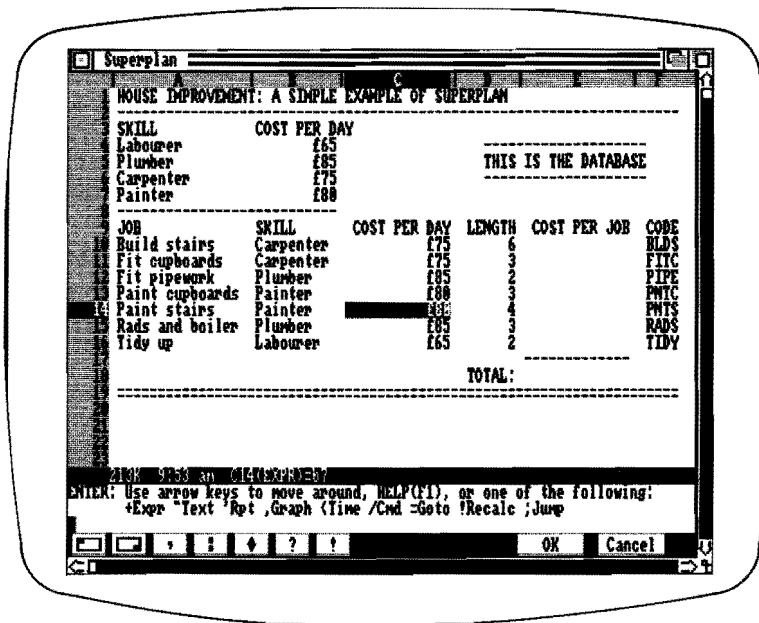
One way of entering them would be simply to type them as numbers, just as you did before. However, that would mean that if you subsequently decided to change this cost, you would have to change all three figures.

A better way is to make Superplan fetch the figure for you. To do this, move the cursor to cell C13 and enter:

b7_

Then move the cursor cell C14 and enter the same. Instead of displaying 'b7' in each cell, as you might have expected, Superplan recognises your entry as a cell reference and looks in cell B7 for the number you want to enter.

Your screen should now look like this:



THE SPREADSHEET

This word is another piece of computer jargon. It simply refers to the part of the worksheet in which you perform numerical calculations, usually of a financial nature.

Some financial calculations now need to be performed in column E, so move the cursor to cell E10. The figure to be entered here is the cost of building the stairs, which is calculated by multiplying the daily cost of a carpenter by the length of the job.

Once again, this can be done means of cell references. Simply enter:

c10*d10_

Superplan now fetches 75 from cell C10 and 6 from cell D10, multiplies them together (the * stands for 'multiply by') and places the result in cell E10.

Similar expressions must now be entered for the other six jobs. However, you do not need to enter them individually; instead you can simply copy (or replicate) them from cell E10. To do this, enter:

/R

for /Replicate, another of the slash commands. Then press **_** to tell Superplan that you want 'Regular' replication.

You must then specify the reference of the cell you are copying from; in fact Superplan has already displayed it on the entry line for you:

e10

To specify the references of the cells you are copying to, simply type a comma (,), then press **↓** to move the cursor to cell E11. Type a colon (:), then move the cursor to cell E16. Notice how the cursor expands to cover the whole range of cells from E11 to E16.

Your entry line should now look like this:

e10,e1:e16

Press **_** and Superplan copies the expression from E10 into the rest of the column, and calculates the results.

The important thing to note about the replication is that all the cell references in the copied expression have been automatically adjusted so that the correct figures are used. That is, the expression in cell E11 multiplies cells C11 and D11, the expression in cell E12 multiplies cells C12 and D12, and so on. Superplan has saved you the trouble of having to change these references yourself.

The final calculation that must be done is to add up all these figures and put the total cost of the work in cell E18. So move the cursor to cell E18 and enter:

+SUM(e10:e16)_

The **+** tells Superplan that what follows is an expression for calculating a value, and is not a piece of text. SUM is one of the Superplan functions, a ready-made expression designed to perform a number of calculations. It saves you the trouble of having to type:

e10 + e11 + e12 + e13 + e14 + e15 + e16

MORE INFORMATION

Superplan provides a full range of mathematical operations, including multiplication, division, addition, subtraction and exponentiation, and a full range of logical operations, including equals, not equals, less than, not less than, greater than and not greater than.

Superplan also provides a full range of functions: mathematical, logical, time, calendar, statistical, database, financial and special.

For a summary of these and other aspects of expressions, enter **+** and press **F1 HELP** or click on the **?** button. For full details of expressions, functions and operators, see Chapter 1 of the User's Guide.

You are now in a position to see how all these expressions are not just quick ways of entering numbers or performing calculations, but can help you make decisions by quickly showing you the effect of changes in your initial data.

For example, suppose you wanted to see what effect an increase in the daily costs of a painter would have. Move the cursor to cell **B7** and enter, say:

83_

then simply press **F3 RECALC** or the **!** key. Almost immediately, Superplan recalculates all the expressions and displays the new total in cell **E18**.

This is another of the options on the help line:

!Recalc

and its purpose is to recalculate all the expressions in the worksheet.

MORE INFORMATION

For more information on **!Recalc**, see the last page of the general help and Chapter 1 of the User's Guide.

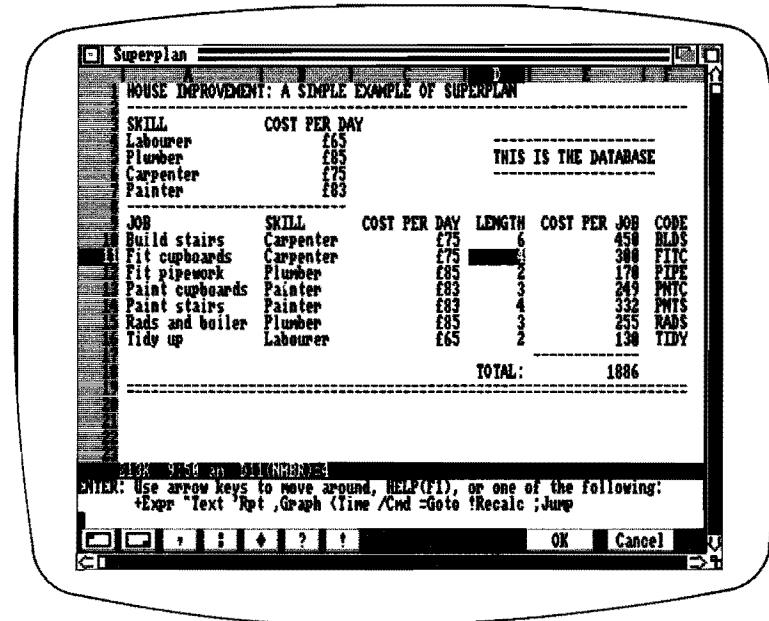
If you wish, you can set Superplan so that it will always recalculate the entire worksheet whenever you make a new entry. This is one of the global options that you can set for Superplan; see the help for the **/Global** command and Chapter 1 of the User's Guide for details.

To see what the effect would be of increasing the time taken to fit the cupboards, move the cursor to cell D11 and enter:

4.1

then press F3 RECALC or the ! key. Once again, Superplan recalculates the new figures.

Your screen should now look like this:



Before you leave this part of the example, try out another useful feature of Superplan. This will enable you to rearrange all the jobs in order of their total costs.

Enter:

/T

for /Table, another slash command, then:

A

for Arrange, then press .1 to tell Superplan that you only want to rearrange a particular part of the worksheet, not all of it. The cells you want to rearrange are those in the 'block' with A10, F10, F16 and A16 at the four corners. To define this block to Superplan, simply enter:

a10:f16.1

Next Superplan asks you for the 'key column'. That is, the column containing the figures that will determine the final order of your rearrangement – in this case column E. So type:

e ↵

Finally, press ↵ to tell Superplan to put the cost in ascending order.

Before you continue, however, you must return these rows to their original order. This is because there are more entries in this example which refer to this information, and you must ensure that they still refer to the correct cells.

The jobs were originally in alphabetical order of CODE, so to rearrange on that column, enter:

/T ↵ ↵ f ↵ ↵

MORE INFORMATION

The /Table Arrange command is particularly useful for organising large tables of similar kinds of information, such as personal records, product lists, or client records.

Using other /Table facilities, you can also find, select or delete certain records, and perform many other useful record-keeping functions. For more details see the help for the /Table command and Chapter 3 of the User's Guide.

THE TIMESHEET

To look at the timetable for all these jobs, press the Shift and ↓ keys together. Immediately the screen moves down the worksheet by one full screen. The people who are to do the jobs are listed in column A, with their respective skills in column B.

If you move the cursor to one of the skills you will see that they have all been obtained by means of references to cells A4 to A7, rather than being entered directly.

The actual timesheet is off the right-hand edge of the screen, mainly because it requires a large number of narrow columns of equal width. But you will soon be able to see it all on the screen.

First, however, you must 'fix' column A on screen, so that when you bring in the timesheet from the right, the workmen's names won't disappear off the left.

To do this, move the cursor to any cell in column A and enter:

/H

for /Heading, another slash command, then:

V

for vertical. Superplan immediately highlights the entire column and moves the cursor to column B. Column A is now fixed on screen, in much the same way as the row numbers and column letters are fixed. You are now free to move the screen to the timesheet.

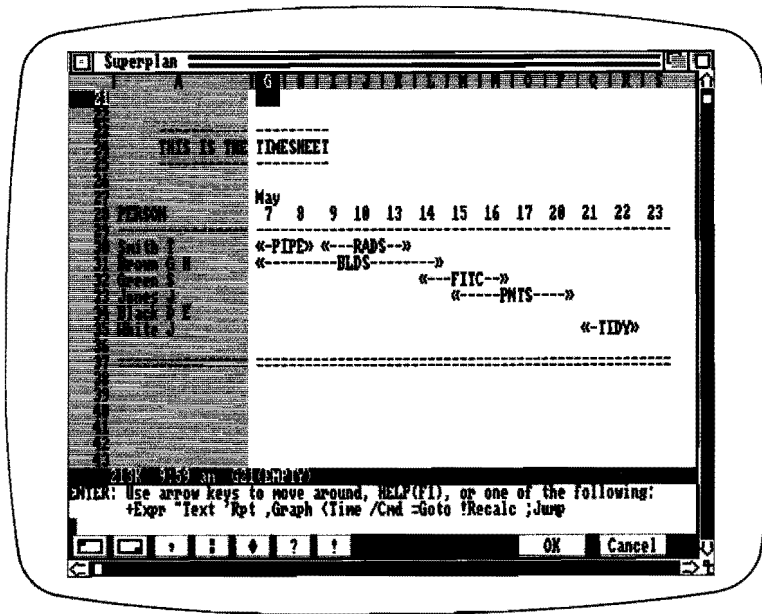
To do this, enter:

=g21_

The = tells Superplan to move the cursor to the specified cell reference, in this case G21. It is another of the options on the help line:

=Goto

Your screen should now display:



The timesheet defines each column of the worksheet as a working day in May. This has been done automatically by the /Calendar command.

The entry MAY and the day numbers at the top of each column have been automatically taken from the calendar by calendar functions. Note that the weekends and holidays on May 6th and 27th have automatically been omitted.

MORE INFORMATION

The /Calendar command allows you to define the working hours of each day and the working days of each month. It allows you to specify time units of half-hours, hours, days, weeks, months, quarter-years, half-years or years.

It also allows you to link these time units to the columns of the worksheet. The calendar functions can then be used to display labels for these columns in whatever format you require.

More information on /Calendar may be found by typing /C and pressing F1 HELP. The calendar functions are listed in the help for expressions (type + and press F1 HELP or click on the ? button). Full details are given in Chapters 1 and 2 of the User's Guide.

The timesheet is almost complete. It shows that Smith is to fit the pipework, radiators and boiler. Brown is to build the stairs, Green is to fit the cupboards, and so on.

Note that because the names of the jobs are quite long, the job codes from the job database have been used instead.

To understand how these jobs were displayed, you can enter the job for Black yourself. This is the job of painting the cupboards.

So move the cursor to any cell on row 34 and type:

<

This tells Superplan you are about to enter a **time command**. This another of the options on the help line:

<Time

A time command defines the name, length, start column and row of a particular job. The code for this job is PNTC, which is cell F13. So instead of typing the full code, simply type:

f13

The length of the job is in cell D13, so type:

,d13

(The comma is needed to separate the length from the job name.)

Now you have to decide when the job can start. Obviously it can only start when the cupboards have been fitted, i.e. when job FITC has been completed. To express this, simply type:

,after(f11,plan)

AFTER is a function that calculates the number of the column immediately following the end of a particular job, in this case job FITC (cell F11). PLAN defines the range of cells in which AFTER is to look after the job, and is a quicker way of typing:

g30:x34

It is an example of the use of the /Name command to name a cell or range of cells. This command is very useful if you are frequently specifying the same range of cells and want to avoid having to remember cell references.

Your time command is now complete. (Since you are entering it on the same row as the job is to appear, you do not need to specify a row.) It should look like this:

<f1,d13,after(f11,plan)

If it does, press **↵**

Job PNTC is displayed in the 20th, 21st and 22nd May.

All jobs are created by time commands. For instance, move the cursor to the start of White's task of tidying up. The status line shows a command with same structure (though in this case the job does not start until the stairs have been painted.)

Since you have added a new job, you must change this command so that tidying up does not start until that is also finished. To do this, type:

/E

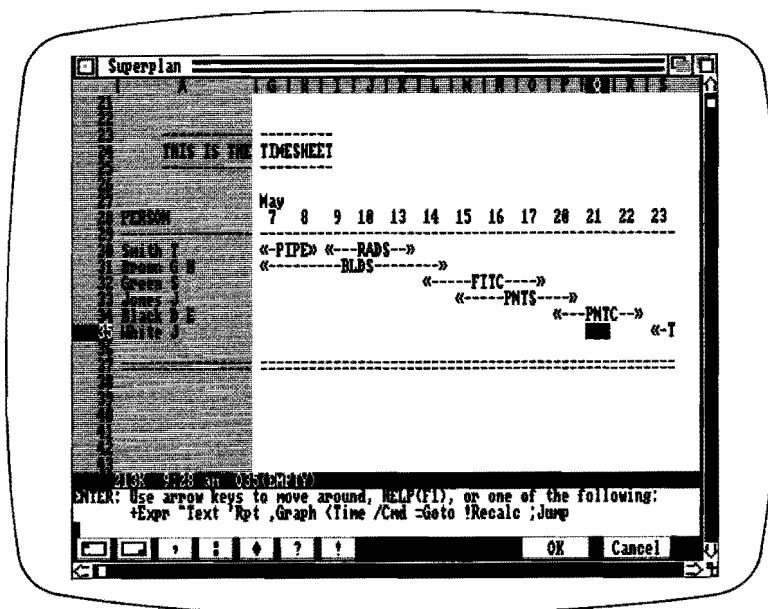
for /Edit, another slash command.

Superplan immediately displays the entire command on the entry line, where you can now change it and re-enter it. So press the ← key until the 'p' of 'plan' is highlighted, then type:

f13

This tells Superplan to start TIDY not only after PNTS has been completed, but also after PNTC. To re-enter the command, simply press ↵:

Your timesheet should now look like this:



This form of timesheet, in which jobs can only be performed in a certain order, is particularly useful for all kinds of project scheduling. And in any such project it is important to know which jobs can be extended or delayed without affecting

the overall length of the project, and which cannot.

This is an easy matter for Superplan. Simply enter:

/K

for /Kritical, another slash command, then press **_**.

After a short pause, Superplan calculates the 'critical path' through the project and displays all the 'critical' jobs in parallel lines.

As you can see, FITC, for example, is a critical job, whereas PNTS is not.

To demonstrate this, type:

=d14_

to move the cursor to the 'length' cell of PNTS and type:

5_

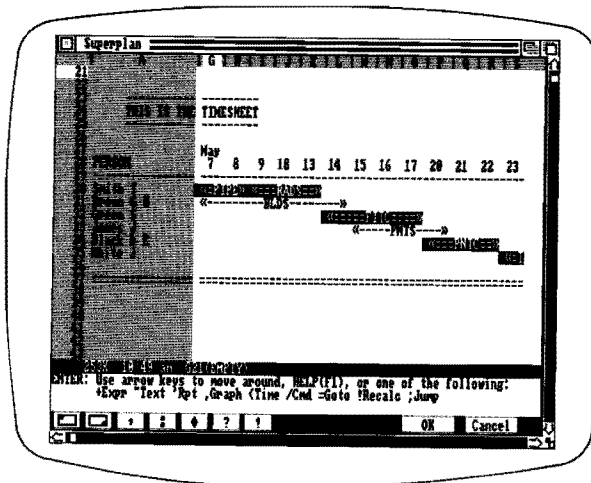
then press **F3 RECALC** or the **!** key to recalculate. Press **HOME** (to go to the top left of the worksheet), then **Shift ↓**. Then type:

=g21_

to display the timesheet and see what effect this has had. The only change has been to increase the length of PNTS by one day.

On the other hand if you now change the length of FITC (cell D11) from 4 to 5, then press **F3 RECALC** or the **!** key, not only does FITC extend by one day, but so does the whole project.

Your timesheet should now look like this:



MORE INFORMATION

For a summary of timesheets and the time commands and time functions, enter < and press F1 **HELP** or click on the ? button. Detailed information on timesheets, calendars and critical path analysis can be found in Chapter 2 of the User's Guide.

GRAPH COMMANDS

This worksheet also contains some simple graph commands for producing a pie chart showing the division of the total cost by different skills. To see these commands, click on the HOME button (to go to cell A1), then press Shift ↓ twice.

Your screen now displays the graph commands for the pie chart. But before you look at them in detail, you must first remove the highlighting from column A. So enter:

/H

for /Heading, then:

N

for None. The highlighting is removed.

Each graph command is in column A, so move the cursor to, say, cell A47. The status line shows:

A47(GRAF) = TIA LO

The graph command is TIA, one of the commands for defining a title. The commands used in the example are:

PIA for defining a single pie chart

PIE for defining each segment of the pie

The TIA command also includes LO, a command modifier that defines the type of underlining used for the title. The PIA command includes the modifier C2, which defines the colour of the pie name.

Most graph commands are followed by other related information. Cells B47 and B48, for example, contain the text of the title and the text of the pie name respectively, while cells B49 to B52 contain the text for the pie segment legends.

Cells C49 to C52 contain the values defining the sizes of the segments. Note that these values are not entered directly as numbers, but as expressions using cells E10 to E16; this ensures that if the total costs change, then these figures also change automatically.

MORE INFORMATION

Superplan can produce many different kinds of graph: pie charts, multiple pie charts, Gantt charts, line graphs, scatter graphs and various kinds of histogram. It can produce different colours, different line styles and thicknesses and different hatching styles, and can print text in many different fonts and sizes. It can also produce free format text presentation.

For a summary of the graph commands and how to enter them, enter , (comma) and press F1 HELP or click on the ? button. For detailed information, see Chapter 4 of the User's Guide.

SETTING UP A GRAPHICS DEVICE

One of the many useful features of Superplan is its ability to produce graphs on different outputs devices – the screen, or a specified printer or plotter. To take a look at this feature, type:

/VO

which stands for /View Options. Superplan temporarily replaces the worksheet by the graphics options.

To select a particular printer or plotter, simply use the ↑ and ↓ keys to highlight each line, then press the space bar until details of your device are shown. Then press ↵ twice.

In this way you can set up Superplan so that it will output to a specified printer or plotter using a particular paper size, print density, plotter speed, and so on.

Now take a look at the pie chart produced by the commands. Enter:

S

for Screen.

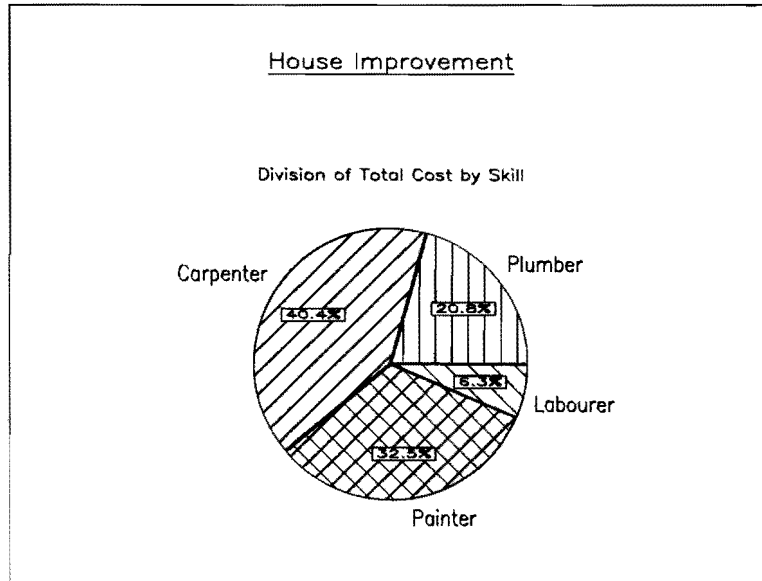
When you have looked at the pie chart, press click on the Close button at the top right of the Graph window or select Close from the Graph menu to return to the worksheet.

PLOTTING OR PRINTING YOUR GRAPH

To draw your graph on a plotter, all you have to do is enter:

D

which stands for Draw.



To print your graph on a printer, enter:

P

which stands for Print. If you want to stop the printing at any time, just press the ESC key. To cancel the /View command press Esc again.

PRINTING REPORTS

If you want to print your worksheet details, first move the top part of the worksheet back onto the screen by clicking on the HOME button.

Although you can easily specify a particular type of printer and such printing options as how many lines will be printed on each page, the number of blank lines at the top and bottom, and so on, Superplan already has default settings for all these options. So to print exactly what is on your screen, enter:

/O JJ

	A	B	C	D	E	F
1	HOUSE IMPROVEMENT: A SIMPLE EXAMPLE OF SUPERPLAN					
2	-----					
3	SKILL	COST PER DAY				
4	Labourer	£65				
5	Plumber	£85			THIS IS THE DATABASE	
6	Carpenter	£75				
7	Painter	£83				
8	-----					
9	JOB	SKILL	COST PER DAY	LENGTH	COST PER JOB	CODE
10	Build stairs	Carpenter	£75	6	£450	BLOS
11	Fit cupboards	Carpenter	£75	5	£375	FITC
12	Fit pipework	Plumber	£85	2	£170	PIPE
13	Paint cupboards	Painter	£83	3	£249	PNTC
14	Paint stairs	Painter	£83	5	£415	PNTS
15	Rads and boiler	Plumber	£85	3	£255	RADS
16	Tidy up	Labourer	£65	2	£130	TIDY
17	-----					
18			TOTAL:		£2,044	
19	-----					
20						

MORE INFORMATION

Using /Output you can output what is on the screen or any block of data in the worksheet; if your data is very wide you can print it sideways down the paper. You can specify running headings and print your data with or without the row and column borders. You can also save your data on disk, for printing later. For a summary see the various /Output help pages; see Chapter 1 of the User's Guide for details.

MORE FEATURES

In this introduction, you have seen how cells can be referred to by their column letter and row number. You can also use the cursor to 'point' to cells, so that you do not have to remember their column and row reference. See the general help pages and Chapter 1 of the User's Guide.

To help you further, remember that individual cells or groups of cells can be given meaningful names, so that you can make your data even easier to manipulate and understand. See the /Name command in the help screens and Chapter 1 of the User's Guide.

Further features include dividing the screen into two independent windows; protecting cells from change; inserting, deleting and moving columns and rows; and consolidating information from two or more worksheets. See the /Window, /Protect, /Insert, /Delete, /Move, and /Join commands in the help pages and Chapter 1 of the User's Guide.

There are many other features of Superplan, but this introduction has only attempted to cover some of them. To find out more, you should consult the User's Guide.

ENDING THIS SESSION

To clear your worksheet of the house-improvement example, enter:

/ZY

/Z stands for /Zap, another slash command; Y stands for Yes, which simply confirms your command. Your worksheet is cleared but the original HOUSE.SPP file still exists on disk, so you have not lost the example.

If you want to return the Amiga Workbench, enter:

/QY

/Q stands for /Quit, another slash command; Y stands for Yes, which again confirms your command.

1000000

1000000

1000000

1000000

1000000

1000000

1000000

1000000

1000000

1000000

1000000

1000000

1000000

1000000

1000000

1000000

CHAPTER 1. WORKSHEET

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INTRODUCTION

The purpose of this chapter is to give you the basic information that will enable you to enter data and manipulate the Superplan worksheet. At the front, it gives an explanation of the options available to you if you load Superplan from the CLI. Then it identifies and defines the different elements of the worksheet, shows you how to move about the worksheet and explains the terms associated with cells.

It explains the purpose of the bottom four lines of the Superplan screen and describes the basic options: getting help, recalculating the worksheet and entering the different kinds of data and commands.

This is followed by general information on expressions, and detailed definitions of the Superplan operators and functions.

Finally, the chapter shows you how to select slash commands and slash command options. It gives detailed descriptions of each command in alphabetical order.

START OPTIONS

Normally, you load Superplan by double clicking on the program icon. Provided you have switched to the Superplan directory or disk (using the CD command), you may also load it from the Command Line Interface (CLI). First enter:

stack 13000_

Then enter the program name:

sp_

If you load Superplan in this way, a number of start options are available to you, which allow you to define the kind of screen the program uses. You can specify the number of colours that are available and whether Superplan opens in a Workbench screen or a custom screen; a custom screen may also be interlaced or non-interlaced.

The start options must be entered after the program name and separated from it by a space. They are as follows:

sp -sw	opens Superplan in the Workbench screen with 4 colours.
sp -sc1	opens Superplan in a custom screen with 2 colours available
sp -sc2	opens a custom screen with 4 colours
sp -sc3	opens a custom screen with 8 colours
sp -sc4	opens a custom screen with 16 colours.
sp -si	opens Superplan in an interlaced custom screen. Must be followed by 1, 2, 3, or 4 specifying the number of colours, as above. sp -si2 , for example, opens an interlaced custom screen with 4 colours.

The default option is **-sc3**; i.e. if you load Superplan by double clicking on its icon or if you enter **sp** without any following parameters, it will start up in a custom screen with 8 colours.

ELEMENTS OF THE WORKSHEET

The Superplan worksheet is very large, so only part of it can be shown on the screen at any one time; this is known as the **window**.

It is also possible to split the screen either horizontally or vertically into two windows: see the /Window command later in this chapter.

Initially the screen shows a window of only the top left hand corner of the worksheet.

Columns	The worksheet is divided vertically into 1024 columns lettered sequentially from A to Z (columns 1 to 26), AA to ZZ (columns 27 to 702) and AAA, AAB, .. (columns 703 onwards).
Rows	The worksheet is divided horizontally into 2048 rows numbered 1, 2, ..
Borders	These show which rows and columns are currently being displayed in the window.
Cell	The worksheet consists of cells, each one formed by the intersection of a row and column.
Cell cursor	This highlighted box moves from cell to cell over the worksheet. It identifies the current cell , ie the cell with which you are currently concerned. The column containing the current cell is the current column and the row containing the current cell is the current row .

WINDOWS

In the previous section we explained how the Superplan display acts as a window on the much larger area that makes up the worksheet. It can also be treated as a standard Amiga window which can be scrolled, resized and moved around the screen.

To resize the worksheet window, click on the size gadget at the bottom right of the screen and keep the mouse button pressed down. Now drag the bottom right-hand corner of the window up the screen. When you have set the window to the size you require, release the mouse button. Notice that you can change the height of the window but not the width.

Once it has been resized, the window may be moved up or down the screen by using the 'drag' bar at the top of the window: place the pointer over the drag bar and keep the left mouse button pressed down; then drag the window to a new position and release the button. If you wish to restore the window to full size, click on the full screen button in the Control Panel. The Control Panel is the row of buttons above the horizontal scroll bar and the full screen button is the one with a diamond symbol in it.

Superplan uses two other windows which it opens on top of the worksheet. These are the Help window and the Graph window. Both can be resized in the horizontal and the vertical directions, using the size gadget.

Initially, the Graph window is one fifth the size of the worksheet window. If you enlarge it, the graph it displays is rescaled to fit the new dimensions of the window.

To close a Superplan window, click on the Close gadget at the top left-hand corner. Closing the main worksheet window is one way of exiting from the program.

Multiple Programs

Provided you have enough memory, you may run Superplan at the same time as other programs and switch between them by clicking on the depth gadgets at the top right of the screen.

For example, suppose you have loaded Superplan and Superbase into memory at the same time. By default both programs are displayed in their own custom screens (as opposed to Workbench screens). This means that to switch from one program to the other, you need to click on the screen gadgets rather than the window gadgets.

If Superplan is the current program, the first step is to resize the Workbench window by a line or two. You can then drag the window down the screen, revealing the screen's drag bar at the top (underneath the window's drag bar). Clicking on the Superplan screen's on one of the depth gadgets brings the Superbase screen into view. Repeat the process with the corresponding Superbase gadget to return to Superplan.

THE HELP WINDOW

Superplan opens the Help window on top of the worksheet window when you click on the Help button or press F1. The Help facility is 'context sensitive': if you have already selected a particular Superplan option such as a slash command or one of the other entry line commands (for a time command, for example), it will give you information about the option you have selected.

If no option has been selected, the window starts with the main Help menu, showing a list of topics on which further information is available. You may select a topic using the keyboard or the mouse pointer.

From the keyboard, use the arrow keys to highlight the topic and then press **↵**. Using the pointer, double click on the topic or click once on it and press **↵**, or click on the Next Page gadget at the top of the Help window (see below).

To close the Help window, click on the Close gadget at the top left-hand corner (or, if the Main Help menu is displayed, you can press the Esc key). The other gadgets at the top right of the window provide the following controls:



Full screen. Resizes the Help window, either to full size or to the size it was previously.



First Page. Selects the first page of Help information.



Next Page. Selects the next page of Help information, if any.



Previous Page. Select the previous page of Help information.

By using the size gadget at the bottom right-hand corner, you may reduce or enlarge the window in both the vertical or horizontal directions. To move the window to a new position on screen, click on the drag (or title) bar at the top and then drag it to the position you require.

Notice that the Help window also has the standard Amiga 'to front' and 'to back' gadgets. Instead of closing the window, it is sometimes useful just to remove it temporarily by clicking on the 'to back' gadget. If you need further information on your chosen topic, you can then retrieve the Help window almost instantly by clicking on the same gadget at the top of the worksheet window.

MOVING THE CELL CURSOR

You can move the cell cursor using four methods:

Arrow keys
Mouse pointer
= Goto option
; Jump option

Arrow Keys

You can use the following keys to move the cell cursor:

←	Moves the cursor left one cell
→	Moves the cursor right one cell
↑	Moves the cursor up one cell
↓	Moves the cursor down one cell

Note also that if you hold down any of the above keys, the cursor steps rapidly from cell to cell.

If you move the cursor to a part of the worksheet that is not in the window, then the worksheet automatically scrolls past the window in the appropriate direction, so that the cursor is always in view.

The following keys also scroll the worksheet past the window:

Shift ↑	Moves the window up
Shift ↓	Moves the window down
F9 or Shift ←	Moves the window left
F10 or Shift →	Moves the window right
TAB	Moves the window right

Mouse Pointer

To move the cursor to any cell in the window, position the mouse pointer in the cell and click the left mouse button.

The scroll bars along the bottom and at the right of the screen allow you to move the window over the worksheet in any direction. Clicking on the arrows at the end of the scroll bars moves the cell cursor by one row or column at a time.

Dragging the scroll bar slider moves the window to a position in the worksheet corresponding to the slider's position on the scroll bar; in other words if you drag the horizontal slider to the centre of the bar, the window will move to a position half way across the worksheet.

Clicking in the scroll bar outside the slider moves the window by the width or height of the screen. So if 23 rows and 9 columns are showing, the window

Moving the Cell Cursor

moves 23 rows or 9 columns right or left, up or down, at a time.

Wherever you are in the worksheet, you can always return to the **HOME** and **END** positions by clicking on their respective buttons (see **The Control Panel** later in this chapter).

HOME Moves the cursor to the top left-hand cell of the worksheet (cell A1).

END Moves the cursor to the cell at the intersection of the right most non-empty column and the lowest non-empty cell row.

= Goto Option

To move the cursor directly to a particular cell, use the =Goto option. Type = (equals), then the column and row of the cell to which you want to move the cursor, then press ↵. For example, to move the cursor directly to the cell in column C and row 30, enter:

= c30 ↵

To move the cursor to the approximate centre of your screen, simply enter:

= ↵

;Jump Option

If your screen is split into two windows (see the /Window command later in this chapter), pressing ; (semicolon) moves the cursor from one window to the other.

Note: the cursor always jumps to the position it occupied the last time it was in the same window.

CELLS

Each cell has a unique reference and contains three types of information: the cell contents, the cell value and the display format.

Cell Reference

A cell reference is the column and row in which the cell is positioned. For example, the reference for a cell in column BG and row 42 is bg42. The column must come first and there must be no embedded spaces or other characters.

A cell reference may be in upper case or lower case. The full significance of this is explained under the Expressions section later in this chapter.

Cells can also be grouped into blocks:

Cell block Any rectangular group of cells.

Partial row A block of cells on one row.

Partial column A block of cells in one column.

A block may be identified by a cell range, consisting of two cell references separated by a fullstop (.) or colon (:). (If you use a fullstop, Superplan automatically displays it as a colon.) The first cell reference is one corner of the block, while the second is the diagonally opposite corner. In the case of a partial row or partial column, the two cell references are the beginning and end of the partial row or column.

For example:

For the cell block:

	E	F	G
12			
13			
14			
15			

these are the valid cell ranges:

e12:g15
e15:g12
g15:e12
g12:e15

For the partial row

	E	F	G
12			

these are the valid cell ranges

e12:g12
g12:e12

Cells

For the
partial column:

E

12	
13	
14	
15	
16	

These are
the valid cell ranges:

e12:e16

e16:e12

Individual cells and cell blocks can also be named; see the /Name command later in this chapter for details.

Cell Contents

A cell may be **empty** or contain an **expression**, **number**, **date**, **text**, **repeated text**, **graph command** or **time command**:

Empty cell	An empty cell is normally displayed as a blank, however, in some cases it may be overrun by the display from an adjacent cell.
Expression	An expression is like a mathematical formula. It consists of various elements combined in such a way as to calculate the value to be displayed in the cell. Numbers and dates are particular kinds of expression.
Text	Text consists of any string of displayable characters. It is displayed in the cell (and, in some cases, in the following cells) exactly as you enter it.
Repeated text	Repeated text consists of a single character, which Superplan automatically repeats along a row, from the cell in which you enter it to the first non-empty cell (or the last column of the worksheet, if all the cells are empty).
Graph cmd	A graph command consists of various instructions to Superplan related to the characteristics of a graph you want produced. It is displayed exactly as you enter it (though it can be 'hidden'; see the /Global command).
Time command	A time command defines the name, length, start column and row of a job. This definition is displayed as a straight line in the appropriate partial row, bounded by arrowheads and identified by the job name.

Cell Value

The value of a cell is the result obtained by evaluating the contents of the cell.

An empty cell or a cell containing text, repeated text, a graph command or a time command always has a value of zero.

A cell containing an expression may have one of five different types of value:

Numeric	eg 100034.32
Textual	eg OVERDUE
Date	eg 15/11/85
Not available	N/A
Error	ERR

Cell Format

The format of a cell determines how data is to be displayed in the cell. You can specify a format for an individual cell, a particular row or column, or the entire worksheet.

The format determines such things as whether the data is to be lined up on the left or right of the cell, how many decimal places should be displayed, whether all figures should be preceded by a £ sign, the colour of the cell, and so on. For details, see the /Format command later in this chapter.

The format of a cell does not affect the contents or value of the cell in any way.

THE STATUS LINE

The status line is the fourth line from the bottom of the screen and usually displays information about the current cell, in the form shown in the following example:

	4% USED 10:23 am F6(EXPR) = SUM(a6:e6)
	Memory Time Cell reference Cell type Cell contents
Memory	This states how much of your computer's available memory is being used by the worksheet.
Time	This is the time on the operating system clock, in the current global time format (see the /Format command later in this chapter).
Cell reference	This is the reference of the current cell.
Cell type	This is the type of information the cell contains: EXPR an expression DATE a date NMBR a number TEXT text REPT repeated text GRAF a graph command JOB a time command EMPTY an empty cell
Cell contents	This is the contents of the current cell (note: not its value).

In many slash command operations, the status line is also used to display such information as current filename, current critical path range, current graphics range, and so on.

The status line also shows when the NUM LOCK, CAPS LOCK and SCROLL LOCK keys are in effect.

THE PROMPT LINE

The line below the status line is the prompt line. Once you have selected an option, the prompt line changes to either a data entry prompt or a slash (/) command prompt (except in the case of Arrow, F1, !Recalc and ;Jump, when the prompt line remains the same).

If you are entering an expression, text, repeated text, a graph command, or a time command, the prompt line indicates the type of data Superplan is expecting. If you decide to perform a slash command, the prompt line lists the next set of options you can select.

THE HELP LINE

The line below the prompt line is the help line. It usually displays brief explanations of each option given on the prompt line.

Note that initially the prompt and help lines list the basic options:

**ENTER: Arrow keys to move around, HELP (F1), or one of the following:
+ Expr 'Text 'Rpt ,Graph < Time/Cmd = Goto !Recalc;Jump**

Some of these (Arrow, = Goto and ;Jump) have been explained already. The remaining options are described later in this chapter.

THE ENTRY LINE

The bottom line of the screen is the entry line, which is where any characters you type are displayed. The entry line cursor automatically moves to the right as you type, showing you where the next character will appear.

The options available to you fall into two general categories: those that require only the option key to be pressed and those that require further data. Those that require only the option key are:

Arrow See earlier in this chapter.

HELP(F1) When you press the F1 key (or click on the ? button), Superplan opens a Help window on top of the worksheet window. Initially, it contains a 'menu' of topics on which you can request more information. Use the arrow keys (or the mouse pointer) to highlight the particular topic you are interested in, then press **↵** to display the first help page for that topic.

Alternatively, if you are in the middle of a particular operation, pressing the F1 **HELP** key automatically gives you the appropriate help pages for that operation. The help facility is available at nearly every stage of Superplan.

You can page backwards and forwards through the help pages, or you can return at any time to what you were doing by pressing **ESC** or clicking on the Close gadget at the top left corner of the window.

!Recalc **F3** or the **!** key (or the **!** button) instantly forces recalculation of the worksheet. All expressions are evaluated and the results are displayed in the appropriate cells.

Normally Superplan evaluates the worksheet in 'natural order', that is, such that cells referred to by expressions elsewhere in the worksheet are evaluated **before** the cells containing the expressions.

It can also be done row-by-row, that is, from left to right along each row and from top to bottom of the worksheet (A1, B1, C1, . . . then A2, B2, C2, . . . and so on). Alternatively, it can be done column-by-column if required, that is, from top to bottom of each column and from left to right across the worksheet. See the **/Global** command later in this chapter for more details.

Alternatively, if you do not want to use **F3** or the **!** key, you can set an option so that recalculation is performed automatically whenever new data is entered (see the **/Global** command).

;Jump See earlier in this chapter.

The options that require further data to be entered are:

/Cmd The "/" character makes available the slash commands. These are described in detail later in this chapter.

+ Expr The "+" character indicates to Superplan that you are about to enter an expression (or number or date) into the current cell. Note: an expression may also begin with certain other characters: see the Expressions section later in this chapter.

"Text The " character indicates to Superplan that you are about to enter text into the current cell. Note: text may also begin with any displayable character: see below.

'Rpt The ' character indicates to Superplan that you are about to enter a character into the current cell which you want repeated along the current row.

,Graph The "," character indicates to Superplan that you are about to enter a graph command into the current cell.

< Time The "<" character indicates to Superplan that you are about to enter a time command on the current row.

= Goto See earlier in this chapter.

With all of these options, you type your data then press `_J`. Your data (the cell contents) is displayed on the status line and the appropriate characters are displayed in the worksheet.

Each of the four arrow keys can also be used instead of `_J`. Each one not only terminates your data and moves it to the current cell, but also automatically moves the cursor to the adjoining cell in the direction of the arrow, ie the `←` key moves the cursor to the next cell on the left, the `→` key to the next cell on the right, and so on.

If you make a mistake in your entry line, use the BACKSPACE key to delete back to the mistake, then type the entry again.

If you wish to delete your entry line, press ESC.

You can also edit the contents of a cell, either by moving the cursor to it and simply typing a new entry, or by using the /Edit command (see later in this chapter).

Entering Expressions

For most expressions, you must start with a numeric digit, . (fullstop), + (plus), - (minus), ((left parenthesis), or @ sign. The prompt line changes to:

ENTER: This is either a number or an expression

Alternatively, you may start with a cell reference. In this case, the prompt line changes to:

ENTER: This is either text or an expression

You may then continue typing your expression. The rules for entering expressions are given in full in the Expressions section later in this chapter. The following are some examples of valid expressions:

```
h8-e8 + 1
+ if(1- ISNA(k10),k10,"LATEST")
@SUM(c10:c42)
+ DOMOY(COL)
- 5
(a4 + 0.92e20)*2
```

Entering Text

The rules for entering text are as follows:

1. You should start text with a " character. The prompt line changes to:

ENTER: This is text

You may then type your text.

Alternatively, if you start your text with an alphabetic character, the prompt line changes to:

ENTER: This is either text or an expression

If you are sure that your text is not also a valid cell reference, you may then continue. If it is a valid cell reference, then you must start with a " character, otherwise Superplan treats it as an expression.

2. The text must not be more than 254 characters long (remember, a space counts as a character). If you attempt to exceed 254 characters, Superplan ignores the extra characters.
3. The text is displayed in the current cell according to the cell format. The default format for text is left justification (ie the text starts at the extreme left of the cell), but you may set it to right or centre justification if you wish (see the /Format command later in this chapter).
4. If the text is longer than the current column width, Superplan continues it into adjoining cells, provided that the current cell is left justified and the adjoining cells are empty. If the text attempts to overrun a non-empty cell, only the left-hand part of the text appears, up to the non-empty cell. If the cell is right justified, the right-hand part of the text that fits in the cell appears, but the rest is not displayed.

The following example shows how the text entry:

"Jobsheet for R.M. Williams: Week ending 19/4/85

would be displayed in three different cells.

	A	B	C	D	E	F
1	Jobsheet for R.M. Williams: week ending 19/4/85					
2	Jobsheet for R.M.		123			
3	Jobsheet	92		3	9	5

In row 2 all the cells were empty, so the full amount of text is displayed.

In row 4 cell C4 was already occupied so the display is truncated at the end of cell B4. In row 6 cell B6 was already occupied, so the display is truncated at the end of cell A6.

Note that cells A4 and A6 still contain the full text, even though the displays have been shortened.

Entering Repeated Text

To enter repeated text, you must start with a ' character. The prompt line changes to:

ENTER: This is repeated text

You may then type your text. The rules for entering repeated text are as follows:

1. The first character you type after the ' character is repeated along the current row from the current cell to the first non-empty cell to the right (or to the edge of the worksheet, if there are no non-empty cells on the row).
2. If you wish to stop the repeated text before it reaches a non-empty cell or the edge of the worksheet, you must create a blank text cell at the required position.

The following example shows how the repeated text entry:

' - _

would be displayed in three different cells:

	A	B	C	D	E	F
1						
2	-----					
3			123			
4		92		3	9	5

In row 2 all the cells were empty, so the row of hyphens extends the full width of the worksheet.

The Entry Line

In row 3 cell C3 was already occupied so the hyphens are truncated at the end of cell B3. In row 4 cell B4 was already occupied, so the hyphens are truncated at the end of cell A4.

Entering Graph Commands

You must start a graph command with a , character. The prompt line changes to:

ENTER: This is a graph command

You may then type your command. The rules for entering graph commands are given in full in Chapter 4.

The following are some typical graph commands in column A:

	A	B	C	D	E	F
1						
2	P14 F3 A5		1985	1986	1987	1988
3	PIE H2 C5	Local	4.1	4.3	5.0	5.3
4	PIE H3 C4	North	4.0	4.2	4.5	4.9
5	PIE H4 C3	South	3.2	3.6	3.9	4.1
6	ANN JC S5	Sales	50	90		

Entering Time Commands

You must start a time command with a < character. The prompt line changes to:

ENTER: This is a time command

You may then type your data. The rules for entering time commands are given in full in Chapter 2.

The following are some examples of time commands:

```
<"design",3
<a5,15,2+END("Repair",ROW),12
<a5,c5,IF(d5-17,30,c19-c5+1)
```

THE CONTROL PANEL

On the bottom line of the screen, there are a number of control buttons for use with the mouse and pointer. Positioning the pointer over one of these buttons and clicking on it has the following effects:



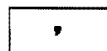
Home

Moves the cursor to the top left-hand cell of the worksheet (cell A1)



End

Moves the cursor to the rightmost and lowest non-empty cell on the worksheet



Comma

Enters a comma on the entry line when you are defining a cell range with the mouse.



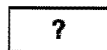
Colon

Enters a colon on the entry line when defining cell ranges with the mouse.



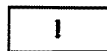
Full screen

Resizes the worksheet window, either to full size or the size it was previously.



Help

Opens the HELP window



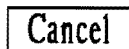
Recalc

Forces recalculation of the entire worksheet



OK

Equivalent to pressing the Return or Enter key



Cancel

Equivalent to pressing the Escape key

Notice that the COMMA, COLON, HELP, RECALC, OK and CANCEL buttons provide alternatives to pressing the corresponding keys on the keyboard; the HOME, END and FULL SCREEN controls are only available by clicking on these buttons.

THE MENUS

The Superplan menus allow you to select the slash commands under mouse control, as an alternative to using the keyboard. They operate in the same way as the Amiga Workbench menus. When you hold down the right mouse button, the menu headings are displayed on the menu bar at the top of the screen.

To pull down a menu, move the pointer to the menu bar so that it highlights the menu heading. As you do this, the menu appears below the heading. You can now select one of the menu options by moving the pointer down the list; highlight the option you want to select and release the mouse button. For more details on selecting an option, see **Slash Commands from the Menus** later in this chapter.

Six menus are available:

Project Edit Graph Options Utility Auto

For details of the options on each menu, see **Menu Options Summary** later in this chapter.

Apart from CLI on the Utility menu, Dump and Close on the Graph menu, and the Auto menu options, each of the menu options is equivalent to a slash command. The particular sequence of keys which you would have to press if you were using the keyboard is shown at the right of the menu option.

If you have loaded Superplan from the CLI, selecting the CLI option opens a CLI window on top of the worksheet window. It allows you to enter AmigaDOS commands while remaining in Superplan. Enter:

endcli_

to exit from the CLI and close the window.

By selecting the Dump option, you can make a copy of the current graph as an image file on disk. The file takes the ILBM image format. See **/View** later in this chapter.

The Close option closes the Graph window.

The Auto menu displays the labels for any autos you may have defined. Selecting one of the options on this menu executes the corresponding auto and is equivalent to pressing the keys for that auto.

Sub-menus

Some menu options present you with a sub-menu. These list secondary options for the corresponding slash command. You select a sub-menu option in the same way as from one of the main menus: move the pointer to the right and highlight the option you require.

MOUSE CONTROLS

You can use the mouse and pointer for any of the following operations:

- Selecting a menu option
- Selecting a screen option
- Moving the cell cursor
- Entering commas or colons on the entry line
- Selecting a slash command from prompt line
- Scrolling the worksheet
- Recalculating the worksheet
- Defining a range of cells
- Opening the HELP window
- Operating the HELP window gadgets
- Sizing and moving windows
- Returning the worksheet window to full size

It is important to note that although each of the mouse operations is described in more detail in this chapter, they are not mentioned elsewhere. In particular, the specific examples, which are given throughout this manual, describe the use of the keyboard controls rather than the mouse controls.

In many cases, it is also possible to carry out the same operation using the mouse – but the manual does attempt to list these alternatives. It is up to you to remember that the mouse controls may provide an easier way of approaching the same task.

For instance, in many places the manual tells you to press the arrow keys to move the cursor to an adjacent cell. Instead of using these keys, you might want to move the cursor by positioning the mouse pointer. Similarly, whenever the manual refers to selecting slash commands from the keyboard, you should remember that you can also select most of them from the menus.

SELECTION SCREENS

Some Superplan commands (/G, /PC, and /FO, for example) use selection screens to present you with further options. A selection screen temporarily overwrites the worksheet screen and lists the options in the form of a menu.

There are two ways of selecting an option from this kind of screen. From the keyboard, use the arrow keys to highlight the item you wish to change. Then press the space bar to cycle through the various options for that item.

For instance, to change the format for the current column, you press:

/FC_

Superplan then displays a selection screen with a list of format features such as the column width and the text justification.

Suppose you now wanted to make the text in this column right justified (so that is aligned with the right hand edge of the cell). First you would press the ↓ until the cursor reached the text justification item. Then you would press the space bar until the right justification option appeared.

Once you have selected an option in this way, press the _ key to enter your selection and return to the worksheet.

The second way of making a selection is using the mouse pointer. Clicking once on an item in the selection screen list, highlights it. Clicking on the item again has the same effect as pressing the space bar: it cycles through the available alternatives.

With the Colours selection screen (displayed when you type /fo) there is a third way of selecting an option. The available combinations of foreground and background colours are shown at the bottom of the screen and clicking on a particular combination assigns it to the currently highlighted item.

EXPRESSIONS

An expression is an instruction to Superplan to calculate a value for the cell in which the expression is entered. As has already been mentioned, this value can be a number, a date, a piece of text, N/A (not available) or ERR (error).

The value obtained from an expression is displayed in the current cell according to the cell format (see the /Format command later in this chapter).

An expression must not be more than 254 characters long. If you attempt to exceed 254 characters, Superplan ignores the extra characters. An expression may consist of:

- Numbers, eg 10, 0.01, 123456.0005, -22e10
- Text enclosed by " (quote) characters, eg "Job3", "Overdue"
- Cell references (including single cell references and names, cell ranges and cell block names), eg A1, TOTALS, d40:g50
- Functions, eg end(A7,7)
- Operators, eg +, -, *
- Parentheses

Numbers

A number must be a string of digits with an optional leading + or -, an optional decimal point and an optional exponential sign (E). The number following the E is called the exponent and is the power of 10 to which the preceding number will be raised. This exponent may range from +99 to -99. Examples of numbers are: 1, 3300.099, 0.42, -2, 4E12, +.353, 1e-7.

Text

If you want an expression to place a piece of text in a cell if it evaluates to a particular result, then you can include the text in the expression, provided it is enclosed by " (quotation) characters. For example, the expression:

=IF(A5=0,"DUE","NOT DUE")

returns DUE if cell A5 is zero, and returns NOT DUE if cell A5 is not zero.

Cell References

If you include a cell reference in an expression, Superplan uses the value of the cell (not its contents) to evaluate the expression. Any change to the value of the cell is automatically reflected in the value of the expression.

Normally, although you enter a cell reference as a column and row combination, Superplan thinks of it in terms of its position relative to the cell containing the expression. For example, if the expression is in cell A5, a reference to cell A1 is thought of as a reference to the cell four rows above. A reference to cell D5 is thought of as a reference to the cell three columns to the right, and so on.

This is why most cell references are called **relative cell references**. Their advantage is that any expression can be moved to anywhere on the worksheet and it will still perform the required calculation. For example, an expression to add up the ten cell values above it will always add the ten cell values above it no matter where it is placed on the worksheet.

In some situations, however, it will be necessary to force Superplan to recognise a cell reference as a reference to a specific cell, even if the expression is moved to another position. Such a cell reference is called an **absolute cell reference**.

Normally, all cell references may be entered in upper or lower case (for example, G44 or g44); Superplan regards them all as relative cell references. To specify an absolute cell reference you must adjust the **Adjust lower case cell references only** option using the /Global command (see later in this chapter). The result of this is that all upper case cell references are treated as absolute, and will always refer to specific cells.

If an expression always remains in the same cell, the distinction between relative and absolute cell references is not significant. However, if you move or copy the expression to another cell, relative cell references are adjusted accordingly, while absolute cell references remain exactly the same.

For example, suppose you have the following worksheet:

	A	B	C	D	E	F
INVESTMENT	10				30	
	20				40	
	30				30	

and you want to provide totals for the two columns of figures in cells A5 and E5 respectively. The appropriate expression for cell A5 is:

+ sum(a1:a3)

which gives the result 60. If you now replicate this expression to cell E5 (see the /Replicate command later in this chapter), the cell references are automatically adjusted to:

+ sum(e1:e3)

and the result is 100. This is because the cell references are **relative**. If, however, the expression in cell A5 is:

+ sum(A1:A3)

and the 'Adjust lower case cell references only' global option is in force, the expression remains exactly the same when it is replicated to cell E5, that is, it still adds up the contents of cells A1, A2 and A3. This is because the cell references are **absolute**.

Pointing

If you want to enter a cell reference in an expression at any point, but cannot remember it, Superplan can get it for you by using a method called pointing.

When you come to the place in the entry line at which you want the cell reference, move the cell cursor with the arrow keys until it is positioned on the cell you require.

For example, to enter the expression:

+SUM(c25:d30)

first of all type:

+SUM(

Then move the cell cursor to cell C25. Notice how the cell references appear on the entry line as you move the cursor. Type:

:

Then move the cell cursor to cell D30. Again, notice how the cell references appear on the entry line. Notice also how the cursor 'stretches' across the worksheet to give you a visual indication of the block you are defining. Then type:

)

to complete the expression.

Normally, cell references are entered in lower case when pointing. If you want to enter an upper case cell reference, press the CAPS LOCK key.

Defining a Range with the Pointer

Many Superplan commands require you to define a range of cells. You may enter the range from the keyboard or by pointing (as described above) but the easiest way of defining a range is to use the mouse pointer.

First select the slash command or menu option for the operation you wish to perform. Then position the pointer at the top left cell in the range. Hold the mouse button down and drag the cursor highlight to the last cell in the range. If the cells are on the same row, this will be the rightmost one; if they are in the same column, it will be the lowest cell; and if you are defining a block of cells, the last cell will be the one at the bottom right.

As an example of defining a range, suppose you want to blank all the cells from A5 to H5. The first step is to select the Blank option from the Edit menu. Then position the pointer in cell A5; hold down the mouse button and drag the cursor highlight to H5. If you look at the entry line, you will see that Superplan has inserted a colon, so that the entry reads:

A5:H5

Clicking on the OK button now completes the operation.

Expressions

Some tasks require you to define two ranges or a single cell reference together with a cell range. In this case, you will also need to use the comma button as well as dragging the cursor. For example, if you wanted to copy the contents of cell A5 to the cells in the range D5 to F10, the procedure would be as follows:

1. Select Copy from the Edit menu
2. Click on cell A5
3. Click on the comma button
4. Click on D5, then drag the cursor to F10
5. Click on the OK button

Cell Names

A cell name may be used in an expression instead of a cell reference. A cell block name may be used instead of a cell range. (See the /Name command later in this chapter).

Note, however, that names are treated as absolute references, that is, they always name the same specific cell or cell block.

Forward and Backward References

The order in which Superplan recalculates all the expressions in a worksheet is row-by-row, column-by-column, or natural order, according to the setting of the relevant /Global option. This order should be born in mind when you are entering cell references in expressions.

If an expression contains a reference to a cell that also contains an expression, then the referenced cell should be earlier in the order of recalculation than the referring cell.

For example, if cell A1 contains:

+ SUM(a2:a5)

and A2 contains:

+ AVG(b1:f1)

then the value of cell A2 should be calculated before the value of cell A1, otherwise cell A1 will use the previous value of cell A2. This cannot be done if you use row-by-row or column-by-column order. It can only be done if you select the natural order option.

If you use the natural order of recalculation, it is possible to get caught in a loop of 'circular' references. That is, cell A refers to cell B, which refers to cell C, which in turn refers to cell A. If you enter a cell reference which completes such a loop, Superplan displays a message on the status line telling you that this has happened. You may then either continue or change the reference.

OPERATORS

There are two types of operator, arithmetic and logical.

Arithmetic Operators

Arithmetic operators define an arithmetic operation to be performed between two numeric values, represented here by x and y.

x^y	raises x to the yth power
$x*y$	multiplies x by y
x/y	divides x by y
$x+y$	adds y to x
$x-y$	subtracts y from x

These values may be numbers or they may be expressions which give numeric results. In the case of + (plus) and - (minus), they may also be dates: a date may be subtracted from a date to give a number; a number may be added to a date to give a date. If you attempt to operate on any other kind of values, Superplan returns ERR (error).

Logical Operators

Logical operators are used in expressions that are either true or false. In plain English, such expressions would be like the following:

The value of cell A5 is the same as the value of cell B5.

The sum of the values of cells A1 to A5 is greater than 100.

The value of cell D3 does not equal 42.5.

Each of the above statements is either true or false. In Superplan they may be expressed as follows:

```
a5=b5
SUM(a1:a5)>100
d3<>42.5
```

In Superplan, if an expression is true it has the value 1. Conversely, non-zero numbers are equivalent to true. If an expression is false, it has the value 0.

A logical operator compares two values (represented here by x and y, which may be numbers, expressions, dates or pieces of text) and returns a value of 1 (true) or 0 (false).

$x=y$	gives 1 if x is equal to y, otherwise 0
$x<>y$	gives 1 if x is not equal to y, otherwise 0
$x<y$	gives 1 if x is less than y, otherwise 0
$x>y$	gives 1 if x is greater than y, otherwise 0
$x\leq y$	gives 1 if x is less than or equal to y, otherwise 0
$x\geq y$	gives 1 if x is greater than or equal to y, otherwise 0

Operators

Expressions that use logical operators can be used to define the criteria for selecting records from a database (see Chapter 3), or for testing different aspects of your worksheet to see whether certain conditions have been met. For example:

IF(A20 > 10,"CR EXCEEDED","CR NOT EXCEEDED")

tests the value of cell A20. If it goes over ten, the expression returns CR EXCEEDED, otherwise it returns CR NOT EXCEEDED.

The logical operators cannot be used to compare different types of value; for example, text with numbers, or dates with numbers.

If you compare one piece of text with another piece of text, characters have the following ascending order of value:

- Special characters (! @ etc)
- Numeric digits
- Lower case alphabetic characters
- Upper case alphabetic characters
- Graphics characters

Precedence

Operations are normally calculated in the following order:

- Exponentiation
- Multiplication/division
- Addition/subtraction
- Logical operations

If an expression contains operators with equal precedence, they are evaluated from left to right.

This order can be changed by inserting parentheses in the expression.

Operations enclosed in parentheses are performed first. Parentheses can be nested within other parentheses. For example, the expression:

$$7*5+3/2$$

would be evaluated in the following order:

$$7*5 = 35$$

$$3/2 = 1.5$$

$$35+1.5 = 36.5$$

but the expression:

$$7*((5+3)/2)$$

would be evaluated in the order:

$$5+3 = 8$$

$$8/2 = 4$$

$$7*4 = 28$$

FUNCTIONS

A function is a 'ready-made' expression designed to calculate a value. It is a short-hand way of asking Superplan to perform a sequence of operations all in one go. For example, the function:

SUM(a1:a6)

is the same as:

a1 + a2 + a3 + a4 + a5 + a6

The following table lists all the Superplan functions in alphabetical order, with the number of the page on which each is described:

ABS	1-34	ERR	1-36	NOT	1-36
ACOS	1-33	EXP	1-35	NPV	1-44
AFTER	1-38	FALSE	1-37	NWEEK	1-40
AND	1-36	FLOAT	1-38	OR	1-36
ASIN	1-34	FV	1-44	PI	1-34
ATAN	1-34	IF	1-36	PMT	1-45
AVG	1-41	INT	1-34	PV	1-44
CHOOSE	1-47	IRR	1-44	RAD	1-34
COL	1-46	ISERR	1-36	RAND	1-35
COS	1-33	ISNA	1-37	ROUND	1-35
COSH	1-33	JDATE	1-46	ROW	1-46
COUNT	1-41	JDAY	1-46	SIN	1-33
DATE	1-40	JNAME	1-38	SINH	1-33
DAVG	1-42	LENGTH	1-38	SQRT	1-35
DAY	1-39	LN	1-35	START	1-38
DCOUNT	1-42	LOG	1-35	SUM	1-41
DEG	1-34	LOOKUP	1-47	TAN	1-33
DMAX	1-43	MAX	1-41	TANH	1-33
DMIN	1-43	MIN	1-41	TELTIM	1-46
DOM	1-39	MON	1-39	TIME	1-40
DOMOY	1-40	MONTH	1-39	TOD	1-39
DOW	1-39	MOY	1-40	TODAY	1-46
DSUM	1-42	NA	1-36	TRUE	1-37
E	1-35	NCOL	1-46	YEAR	1-39
END	1-38	NDAY	1-40		

A function call consists of a function name (which may be entered in upper or lower case), usually followed by one or more **arguments**. These are expressions which define the values to be applied to the function. They must be separated by commas and enclosed in parentheses:

function(expression1,expression2,...,expressionN)

The function name may be preceded by an @ sign.

Spaces are not allowed in a function call, except within a piece of text enclosed by " (quotation) characters.

Functions

Each function call should have the correct number of arguments in the correct order. In the following definitions optional arguments are enclosed by square brackets [].

Cell references and cell ranges may be specified either by typing or by pointing.

In the following descriptions, functions are divided into:

- Mathematical
- Logical
- Time
- Calendar
- Statistical
- Database
- Financial
- Special

MATHEMATICAL FUNCTIONS

Note: each value may be entered either as a number or as an expression giving a numeric value.

COS(value)

Returns the cosine of the degree angle value. Degrees and radians may be converted using the DEG and RAD functions.

Examples: COS(45) returns .70710678118656
COS(DEG(1)) returns .54030230586816

SIN(value)

Returns the sine of the degree angle value. Degrees and radians may be converted using the DEG and RAD functions.

Examples: SIN(60) returns .86602540378443
SIN(DEG(0.5)) returns .47942553860419

TAN(value)

Returns the tangent of the degree angle value. Degrees and radians may be converted using the DEG and RAD functions.

Examples: TAN(30) returns .57735026918961
TAN(DEG(0.4)) returns .42279321873815

COSH(value)

Returns the hyperbolic cosine of the value.

Examples: COSH(1) returns 1.5430806348152
COSH(-1) returns 1.5430806348152

SINH(value)

Returns the hyperbolic sine of the value.

Examples: SINH(1) returns 1.1752011936438
SINH(-2) returns -3.626860407847

TANH(value)

Returns the hyperbolic tangent of the value.

Examples: TANH(1) returns .76159415595576
TANH(-1) returns -.76159415595576

ACOS(value)

Returns the degree angle (between 0° and 180°) of the arc cosine value. If the value is not between -1 and +1, the function returns ERR. To convert degrees to radians, use the RAD functions.

Examples: ACOS(.3) returns 72.542396876278
ACOS(1.1) returns ERR

ASIN(value)

Returns the degree angle (between -90° and $+90^{\circ}$) of the arc sine value. If the value is not between -1 and +1, the function returns ERR. To convert degrees to radians, use the RAD function.

Examples: ASIN(-0.4) returns -23.578178478202
ASIN(-2) returns ERR

ATAN(value)

Returns the degree angle (between -90° and $+90^{\circ}$) of the arc tangent value. To convert degrees to radians, use the RAD function.

Examples: ATAN(-2) returns -63.434948822922

DEG(value)

Returns the degree equivalent of the radian angle value.

Examples: DEG(1) returns 57.295779513082
DEG(.5) returns 28.647889756541

RAD(value)

Returns the radian equivalent of the degree angle value.

Examples: RAD(60) returns 1.0471975511966
RAD(30) returns .52359877559829

PI

Returns pi: 3.1415926535898

ABS(value)

Returns the absolute equivalent of the numeric value. That is, it returns the same value if the value is zero or positive, and it returns the same value, but without the negative sign, if the value is negative.

Examples: ABS(42.1) returns 42.1
ABS(-42.1) returns 42.1

INT(value)

Returns the integer of the numeric value.

Examples: INT(1.923) returns 1
INT(-1.923) returns -1
INT(f6/100) returns the number of 100s in the value of cell f6.

ROUND(value,n)

Returns the value rounded to n decimal places.

Examples: ROUND(42.5678923,3) returns 42.568
ROUND(42.567321,3) returns 42.567

EXP(value)

Returns e (2.718281828459) raised to the power of the numeric value.

Examples: EXP(170) returns 6.761793810485E73
 EXP(-3.21) returns .04035661327203

E

Returns the natural logarithm base: 2.718281828459

LN(value)

Returns the natural logarithm (base e) of the numeric value. If the numeric value is zero or negative, the function returns ERR.

Examples: LN(93.24) returns 4.5351768141676
 LN(EXP(k92)) returns the value of cell k92

LOG(value)

Returns the common logarithm (base 10) of the numeric value. If the numeric value is zero or negative, the function returns ERR.

Example: LOG(93.24) returns 1.9696022648485

SQRT(value)

Returns the square root of the numeric value. If the numeric value is negative, the function returns ERR.

Example: SQRT(16) returns 4

RAND

Returns a random number between 0 and 1.

Note: whenever you recalculate the worksheet, this function returns a different random number.

LOGICAL FUNCTIONS

Logical functions are used in logical expressions. As has already been stated, if a logical expression is true it has the value 1. Conversely, any non-zero number is equivalent to true. If an expression is false, it has the value 0.

Note: each value may be entered as a number, or as an expression giving a value. A group of values may be entered as a cell range or cell block name.

AND(values)

Returns 1 (true) if and only if all the values are non-zero (true). Otherwise it returns 0 (false).

Examples: **AND**(1 + 1 = 2, a4 > b6, 2 - 1 = 1) returns 1 if the value of cell A4 exceeds the value of cell B6
 AND(1 + 1 = 3, a4 < b6, 2 - 1 = 1) returns 0 (the first expression is false)

OR(values)

Returns 1 (true) if at least one of the values is non-zero (true). Otherwise it returns 0 (false).

Examples: **OR**(1 + 1 = 2, a4 > b6, 2 - 1 = 2) returns 1 (the first expression is true)
 OR(1 + 1 = 1, a4 > b6, 2 - 1 = 2) returns 0 if the value of cell A4 is not greater than the value of cell B6

NOT(value)

Returns 1 (true) if the value is 0, otherwise it returns 0 (false).

Examples: **NOT**(2 > 3) returns 1 (2 > 3 is false)
 NOT(2 < 3) returns 0 (2 < 3 is true)

IF(cond-value,true-value,false-value)

Returns the true-value if cond-value is non-zero (true); it returns the false-value if cond-value is zero (false).

Examples: **IF**(3 > 2, "YES", "NO") returns YES (3 > 2 is true)
 IF(3 < 2, "YES", "NO") returns NO (3 < 2 is false)

ERR

Returns ERR (error).

Example: **IF**(b6 > 10, ERR, b6) returns ERR if the value of cell B6 is greater than 10

ISERR(value)

Returns 1 (true) if the value is ERR, otherwise it returns 0 (false).

Example: **ISERR**(b1) returns 1 if the value of cell B1 is ERR

NA

Returns N/A (not available).

Example: **IF**(b6 > 10, NA, b6) returns N/A if cell B6 is greater than 10

ISNA(value)

Returns 1 (true) if the value is N/A (not available), otherwise it returns 0 (false).

Example: ISNA(b1) returns 1 if the value of cell B1 is N/A

FALSE

Returns 0.

Example: IF(b6 > 10,FALSE,b6) returns 0 if the value of cell B6 is greater than 10

TRUE

Returns 1.

Example: IF(b6 > 10,TRUE,b6) returns 1 if the value of cell B6 is greater than 10

ERR, NA, TRUE and FALSE can be used to indicate the status of a particular aspect of your worksheet. For example, the expression:

+ IF(a1 = 10,FALSE,TRUE)

tests the value of cell A1. If A1 = 10 it returns 0 (FALSE); otherwise it returns 1 (TRUE). Similarly the expression:

+ IF(a2 < 10,NA,ERR)

returns N/A if A2 is less than 10, otherwise it returns ERR.

Elsewhere in the worksheet you can then use ISERR and ISNA to test for the presence of ERR and N/A, and other logical functions to test for the presence of TRUE and FALSE.

TIME FUNCTIONS

The time functions are used to return information about the jobs on a timesheet. Full details of how to use these functions are given in Chapter 2.

As many as ten job names may be entered for each function, separated by commas. Each one may be entered either as a piece of text enclosed by " (quotation) characters, or as a reference or name of a cell containing text. The word ANY may be used instead of job names, to indicate any job.

The row may be entered as a number or as an expression giving a numeric value, provided that the expression is not a single cell reference. The range may be entered as a cell range or as a cell block name.

START(*jobnames,row/range*)

Returns the number of the column containing the first occurrence of the named job(s), on the specified row, or within the specified cell range.

END(*jobnames,row/range*)

Returns the number of the column containing the last occurrence of the named job(s), on the specified row, or within the specified range.

LENGTH(*jobnames,row/range*)

Returns the total number of cells occupied by the named job(s), on the specified row, or within the specified range.

AFTER(*jobnames,row/range*)

Returns the number of the column immediately following the latest end of the named job(s), on the specified row, or within the specified range. Note that this function must be used to define the starts of dependent jobs in a critical path analysis (see Chapter 2 for details).

FLOAT(*names,row/range*)

Returns the total number of columns of 'float' for the named job(s), on the specified row, or within the specified range. Note that this works only if a critical path is active. According to which option was chosen using the /Kritical command, the value returned is either the Total Float or the Free Float. See the /Kritical command later in this chapter and Chapter 2 for details.

JNAME(*cell*)

Returns the name of the job in the cell referred to by the cell reference.

CALENDAR FUNCTIONS

The /Calendar command (see later in this chapter) allows you to turn part or all of your worksheet into a computerised wall planner. It transforms columns into time units (half-hours, hours, days, weeks, months, quarters, half-years or years), starting at a specified time and/or date.

The following functions allow you to access these times and dates. The column may be entered as a number (where A = 1, B = 2, etc.), or as an expression giving a numeric value. Note that the functions do not return any value unless a calendar has been defined and linked to the worksheet. See Chapter 2 for more information, and Chapter 5 for some examples.

In the following descriptions, the examples use an hourly calendar linked to column E at 9 a.m. on 22nd April 1985. The exact display format of what is returned is governed by the /Format command (see later in this chapter).

TOD(column)

Returns the time of the column number.

Example: TOD(5) returns 9.00

DAY(column)

Returns the day of the month (in numeric form) of the column number.

Example: DAY(5) returns 22

DOW(column)

Returns the day (in alphabetic form) of the column number.

Example: DOW(5) returns Monday

MON(column)

Returns the month of the column number.

Example: MON(5) returns 4

MONTH(column)

Returns the month (in alphabetic form) of the column number.

Example: MONTH(5) returns April

YEAR(column)

Returns the year of the column number.

Example: YEAR(5) returns 85

DOM(column)

Returns the day and month of the column number.

Example: DOM(5) returns 22/ 4

DOMOY(column)

Returns the day, month and year of the column number.

Example: DOMOY(5) returns 22/ 4/85

MOY(column)

Returns the month and year of the column number.

Example: MOY(5) returns 4/85

NWEEK(column)

Returns the yearly week number of the column number.

Example: NWEEK(5) returns 17

NDAY(column)

Returns the day number of the column number.

Example: NDAY(5) returns 112

DATE(date)

Returns the number of the column containing the specified date. The date must be in the format defined by /Format (see later in this chapter), and enclosed in " (quotation) characters. This is so that there is no confusion between alternative date formats, such as dd/mm/yy or mm/dd/yy.

Example: DATE("22/4/85") returns 5

TIME(date,time)

Returns the number of the column containing the specified date and time. The date and time must be in the formats defined by /Format (see later in this chapter), and enclosed in " (quotation) characters.

Example: TIME("22/4/85","9") returns 5

A particular use of the calendar functions is to label the columns of a timesheet. To do this, use one of the calendar functions with the COL function. For example:

DOM(COL)

returns the day and month of the column in which it is placed. If this expression is replicated along a row, the result is a date label for every column. See Chapter 2 for more details.

The + (plus) and - (minus) arithmetic operators may be used with date values. For example:

DOMOY(5) + 7

(using the same calendar as for the above examples) returns 1/ 5/85 if the working week is Monday to Friday, and the time units are changed to days.

STATISTICAL FUNCTIONS

Each value may be entered as a number, or as an expression giving a numeric value. Note that non-numeric cells have a numeric value of 0. A group of values may be entered as a cell range or cell block name.

SUM(values)

Returns the sum of the numeric values.

Examples: SUM(1,2,3,4,5,6,7,8) returns 36
SUM(a1:a16) returns the sum of all the numeric values in cells A1 to A16.

COUNT(values)

Returns the number of numeric values.

Example: COUNT(1,2,5,6,7,8) returns 6

AVG(values)

Returns the average value of the numeric values.

Example: AVG(1,2,3,4,5,6,7) returns 4

MAX(values)

Returns the maximum of the numeric values.

Example: MAX(1,2,3,4,5,6,7,8) returns 8

MIN(values)

Returns the minimum of the numeric values.

Examples: MIN(1,2,3,4,5,6,7,8) returns 1
MIN(a1:c12) returns the smallest numeric value in the cell block a1:c12.

DATABASE FUNCTIONS

The database functions are database equivalents of the statistical functions described in the previous section. They work in exactly the same way as the statistical functions, except that they obtain the values to be worked on from records selected from a database according to certain criteria.

Full details of how to use these functions are given in Chapter 3. What follows is a brief summary.

Each function requires an input range. This is the cell range (or cell block name) that defines the part of the database from which the records are to be selected.

The next argument is the criterion range. This is the cell range (or cell block name) that defines the cells in which you have put your criteria that the selected records must satisfy. Note that a blank cell in a criterion range will match any entry in that field.

The final argument is the field containing the values that are to be worked on. This may be entered as the field name or as the number of the column containing the field, 'offset' from the first column of the input range. The first column of the input range has an offset of 0, the second column an offset of 1, the third an offset of 2, and so on.

For each function, Superplan selects those records from the database that satisfy the criteria. Note that a record will be selected more than once if it satisfies more than one row of the criterion range.

Superplan then uses the values from those records that are in the specified field. For example:

DSUM(a1:d30,CRIT,2)

selects records from the input range A1:D30 according to the criteria specified in the cell block named CRIT, then adds up all the values in those selected records that are in column C (field offset 2).

The following is the complete list of database functions.

DSUM(*input,criterion,field*)

Returns the sum of the numeric values in the specified field of the selected records.

DCOUNT(*input,criterion,field*)

Returns the number of numeric values in the specified field of the selected records.

DAVG(*input,criterion,field*)

Returns the average of the numeric values in the specified field of the selected records.

DMAX(input,criterion,field)

Returns the maximum of the numeric values in the specified field of the selected records.

DMIN(input,criterion,field)

Returns the minimum of the numeric values in the specified field of the selected records.

FINANCIAL FUNCTIONS

IRR(guess,values)

Returns an approximate internal rate of return for a series of cash payments made at regular intervals, starting with an initial guess at the correct answer. The internal rate of return is the discount rate that gives the net present value of the cash flow a value of 0.

Normally, an initial guess of between 0 and 1 will produce a result. It may be entered as a number or as an expression giving a numeric value. In some cases, different guesses may result in different answers.

The values may be entered as numbers or as one or more expressions giving numeric values.

Example: If the initial guess is 0.14 and the payments are — 1000, 500, 400, 200 and 100:

$\text{IRR}(0.14,-1000,500,400,200,100)$ returns .10221

NPV(rate,values)

Returns the net present value of a group of cash flows at a particular interest rate or discount. The interest rate or discount is entered either as a number or as an expression giving a decimal value (not a percentage). The cash flows (receipts or payments) are the numeric values; they may be entered as numbers, or as one or more expressions giving numeric values.

Example: If the interest rate is 9% and the cash flows are 400, 300 and 500:

$\text{NPV}(0.09,400,300,500)$ returns 1005.5682150747

See also the cashflow example described in Chapter 5 for another example of the use of this function.

FV(payment,rate,term)

Returns the future value of an annuity, given the regular payment, the interest rate per payment period and the term, ie the number of payment periods. Each value may be entered as a number or as an expression giving a numeric value. The interest rate must be a decimal value, not a percentage.

Example: If the regular payment is £200, the interest rate is 10% per year, and the term is 24 years:

$\text{FV}(200,1,24)$ returns 17699.465351615

PV(payment,rate,term)

Returns the present value of an annuity, given the regular payment, the interest rate per payment period and the term, ie the number of payment periods. Each value may be entered as a number or as an expression giving a numeric value. The interest rate must be a decimal value, not a percentage.

Example: If the regular payment is £200, the interest rate is 10% per year, and the term is 24 years:
PV(200,.1,24) returns 1796.9488040105

PMT(principal,rate,term)

Returns the repayment per period of a given principal, at an interest rate per period, over a term, ie the number of periods. Each value may be entered as a number or as an expression giving a numeric value. The interest rate must be a decimal value, not a percentage.

Example: If the principal is £20000, the interest rate is 10% per year, and the term is 24 years:

PMT(20000,.1,24) returns 2225.9955270138

A monthly repayment can be calculated by dividing the interest rate by 12; so for a term of 60 months:

PMT(20000,.1/12,60) returns 424.94089422536

SPECIAL FUNCTIONS

COL

Returns the number of the column in which the expression containing COL is positioned.

Example: COL returns 4, if the expression is in column D

NCOL(*column*)

Returns the number of the alphabetic column reference, which must be enclosed by " characters.

Examples: NCOL("a") returns 1
NCOL("ab") returns 28

ROW

Returns the number of the row in which the expression containing ROW is positioned.

Example: ROW returns 4, if the expression is in row 4

TODAY

Returns the operating system date.

TELTIM

Returns the operating system time.

JDAY(*value*)

Returns a modified Julian day, month and year of the value, in the date format defined by /Format (see later in this chapter). The value is the number of days that have elapsed since 1st January 1900. It may be entered as a number or as an expression giving a numeric value.

Examples: JDAY(3648) returns 26/12/09
JDAY(36525) returns 31/12/99

JDATE(*date*)

Returns the number of the Julian date, ie the number of days that have elapsed since 1st January 1900. The date must be in the format defined by the /Format command (see later in this chapter) and enclosed in " (quotation) characters.

This function and the JDAY function are independent of the Superplan calendar. They can be used with the + (plus) and - (minus) arithmetic operators. Their purpose is to provide compatibility with other worksheet programs and to allow simple date arithmetic to be performed outside the 10-year Superplan calendar.

Examples: JDATE("31/12/99") returns 36525
JDATE("31/12/85")-JDATE("1/1/85") returns 183

SBP10 "1/1/1900" = 693585

CHOOSE(*n,values*)

Returns the *n*th value. *n* may be a number or an expression giving a numeric value. Values may be entered as numbers or text, or as one or more expressions giving numeric values or text.

If the counter is not a whole number, Superplan ignores the fractional part and uses only the integer. If the counter is less than 1 or larger than the number of values, the function returns ERR.

Example: CHOOSE(3,a1:a6) returns the value of cell A3

See also the cashflow example described in Chapter 5 for another illustration of this command.

LOOKUP(*value,range,[offset]*)

Searches the specified range (which must be a partial column or partial row) for a cell with a value equal to the specified value, and, if no offset is specified, returns the value of the cell immediately adjacent to it. If there is no equal value, it selects the cell with the next highest value.

If a partial column is specified, the returned value is taken from the next column on the right. If a partial row is specified, the returned value is taken from the next row below. The column or row from which the return value is taken may be displaced by adding the offset argument. The default value is 1 and will result in the return value being taken from the adjacent cell. If you wanted the return value to be taken from the row three cells below the partial row, you would enter the number 3 as the offset value.

Note: The offset value is optional, but if the worksheet is to be saved as a Lotus 1-2-3 file the offset values must be present in all cases.

Example:

	C	D	E	F
1	1	London		
2	2	Hull		
3	3	Oxford		
4	4	Leeds		
5	5	Reading		

LOOKUP(1,c4:c8) returns London

LOOKUP(3.5,c4:c8) returns Leeds

SLASH COMMANDS

The slash commands control various aspects of Superplan. Some you will use when you are initially setting up a worksheet, others while you are developing and maintaining your worksheet.

The following sections show you how to select slash commands, then select options and enter data. There is a table giving a summary of all the slash commands at your disposal, followed by detailed descriptions of each one.

SLASH COMMANDS FROM THE KEYBOARD

The / character makes the slash commands available to you. As soon as you press the / key, the prompt line displays:

A B C D E F G H I J K L M N O P Q R S T U V W X Z Help

These represent the first letters of the slash commands. To select a command, you may use one of two methods:

1. Type the appropriate letter (do not press **↵**).
2. 'Point' to the appropriate letter. To do this, note that the first command (**A**) on the prompt line is highlighted. This highlighting is called the prompt line cursor and can be moved to the right or left through the command letters by using the **←** and **→** keys (this is possible because you do not require control over the cell cursor at this point). As you move from one command letter to another, note that the help line displays a short explanation of each command. When the cursor is on the command you require, press **↵**.

In both cases, Superplan displays the full command word on the prompt line, followed by the options available under this command. For example, if you type **D** (or point to **D** and press **↵**), Superplan displays:

DELETE: Row Column Help (F1)

Another way of displaying the slash commands is to click the left mouse button while the pointer is positioned anywhere on the prompt or help lines. You can then select a command by positioning the pointer on its corresponding letter and clicking the mouse button again.

SELECTING SLASH COMMAND OPTIONS

With some slash commands, the appropriate operation will then be performed straight away. With others, you will be presented with a further list of options, from which you must make your selection, and so on until the required operation is performed.

Some options require you to enter data, such as a filename or a cell reference. In these cases, you simply type the required data on the entry line, just as if you were entering data into the worksheet, then press **↵** when you have finished.

If a cell reference or range is required, you may point to the appropriate cell instead of typing the reference, as described earlier in this chapter under **Pointing**. Alternatively, you may enter a cell name or cell block name (see the **/Name** command).

If you make a mistake while entering data, you may use the **BACKSPACE** key to go back over the mistake and correct it.

If you select the wrong option by mistake, you may return to the previous level by pressing the **DEL** key.

If at any time you wish to abort a command, press **ESC**.

You can get help at any stage by pressing the **F1** key, the **?** key, or by pointing to the **Help** option.

SLASH COMMANDS FROM THE MENUS

Most of the slash commands are also available from the Superplan menus. But they are organized in a slightly different way from the keyboard options.

Selecting some menu options is directly equivalent to pressing the '/' key followed by a letter. Others represent a slash command together with one of its subsidiary options. Pressing the Save option on the Protect menu, for example, has the same effect as pressing /S followed by S for Superplan files.

Another example is the Graph menu. Each of the options here is equivalent to one of the further options belonging to the /View command.

You can see at glance exactly what a particular menu option does, by looking at the letters at the right of the option. Thus for the Print option on the Project menu, the letters are:

/op

This means that selecting Print has the same effect as typing /OP: it selects **Print** as a subsidiary option of the /Output command.

In general, the menu options represent the most commonly used slash commands and slash command options. Other less common commands such as /Table or /Kritical are not available from the menu and must be selected from the keyboard.

Once you have selected a menu option with the mouse pointer, you may need to return to the keyboard in order to complete the operation.

ENTERING FILENAMES

Some slash commands require you to enter filenames. The general form of a filename is:

drive:path1/path2/.../pathN/name

drive: is optional and is the drive name (df0:, df1:, dh0:, dh1:, and so on) designating the disk drive on which the file resides, and is only necessary if the file is not on the logged in drive.

path1/
... are optional (see the documentation for your operating system for more information).

/pathN/

name is the name of the file.

Superplan has the facility to enable you to specify a common prefix for all your Superplan files, to ensure that they automatically have the same drive or directory, for example. See the /Utilities Prefix command later in this chapter for more details.

Superplan is 'case insensitive' and ignores the differences between upper and lower case; so you may enter filenames in upper or lower case. For example, the file specifications:

worksheet.time.rr

WORKSHEET.TIME.RR

are both assumed to refer to the same file.

SLASH COMMAND SUMMARY

/Auto	
Show	List all auto commands assigned to special keys
Edit	Create/Edit auto command assigned to special key
Delete	Delete auto command
/Blank	
Blank the contents of one or more cells	
/Calendar	
Options	Specify time units, working week and calendar start date
Link	Define timesheet link date
Edit	Edit the monthly calendar and the working day
Clear	Remove timesheet link and reset calendar to defaults
/Delete	
Delete one or more rows or columns	
/Edit	
Change the contents of the current cell	
/Format	
Define display format and colour of cell, cell block, row, column or worksheet	
/Global	
Define various global options:	
Relative/absolute cell reference adjustment	
Relative to absolute cell reference conversion	
Manual/automatic recalculation	
Natural order/row-by-row/column-by-column recalculation	
Protected cells available/not available	
Graphics commands display on/off	
Decimal point/comma	
/Heading	
Define one or more rows and/or columns as headings	
/Insert	
Insert one or more blank rows or columns	
/Join	
Show	List all links with other worksheets
Add	Create a link with another worksheet
Delete	Delete a link with another worksheet
/Critical	
Path	Calculate and display the critical path
Free Float	Calculate and display the critical path and free floats
Total Float	Calculate and display the critical path and total floats
Range	Define the critical path range
Clear	Clear critical path
/Load	
Load a disk file (various formats) into the worksheet	
/Move	
Move the current row or column to another position	

/Name	
Show	List all names of cells or cell blocks
Add	Name a cell or cell block
Delete	Delete the name of a cell or cell block
/Output	
Printer	Print worksheet data
Disk	Output worksheet data to a disk file
Configure	Select printer type and set printing options
/Protect	
Protect	Protect one or more cells from change
Unprotect	Remove protection from one or more cells
/Quit	Leave Superplan and return to operating system
/Replicate	Make one or more regular or orthogonal copies of one or more cells
/Save	Save worksheet in a Superplan, CSV or DIF disk file
/Table	
Query	Find, copy or delete selected records from a database
Arrange	Sort rows of cell block according to 'key' column
Fill	Fill a cell block with a sequence of numbers
What-if	Create a table showing results of changes in the value of one or two cells/Utilities
/Utilities	
Status	Display memory usage
Directory	List a disk file directory
Command	Allows you to enter operating system commands
Prefix	Define a common prefix for all filenames
/View	
Screen	Display graph on screen
Print	Print graph on a printer
Draw	Draw graph on a plotter
Range	Specify the current graphics range
Window	Specify the graphics windows
Colour	Examine the screen, printer and plotter colour tables
Options	Specify the screen, printer and plotter type and options
/Window	Split screen into two windows; display expressions
/Xecute	
Boundary	Protect all or part of the worksheet
Learn	Enter macros automatically
Step	Execute autos and macros step by step

/Zap Clear worksheet of all data

Each of the detailed descriptions of the above commands is divided into four sections:

What it Does All the operations the command can perform.

How it works A detailed description of how to use the command.

Examples Some examples of the use of the command.

Rules Any particular rules that must be observed
when using the command.

MENU OPTIONS SUMMARY

Project Menu

New /zy	Clear worksheet of all data
Load Superplan file	
Merge /ls	Load a Superplan file from disk, appending it to the current worksheet
New /z/l	Clear the worksheet, then loads a Superplan file from disk
Save /ss	Save the worksheet in a Superplan file
Save As /ss	Save the worksheet under new name
Print /op	Print worksheet data
Quit /q	Leaves Superplan and returns to the Amiga Workbench

Edit Menu

Blank /b	Blank the cell where the cursor is
Copy /rr	Makes a regular copy of one or more cells
Move /m	Move the current row or column to another position
Insert	
Row /ir	Insert one or more blank rows
Column /ic	Insert one or more blank columns
Delete	
Row /dr	Delete one or more rows
Column /dc	Delete one or more columns
Protect	
Protect /pp	Protect one or more cells from change
Unprotect /pu	Remove protection from one or more cells
Cell /e	Change the contents of the current cell

Graph Menu

Display /vs	Display graph on screen
Print /vp	Print graph on printer
Draw /vd	Draw graph on plotter
Dump	Dump a graph in .IFF format for loading into other programs (eg Superbase).
Options /vo	Specify screen, printer and plotter type and options
Close	Close the graph window

Menu Options Summary

Options Menu

Global /g Define various global options

Format

Global /fg Define display format for all cells
Column /fc Define display format for a column
Row /fr Define display format for a row
Field /ff Define display format for a field
Colours /fo Define screen colours

Heading

Horizontal /hh Specify one or more rows as headings
Vertical /hv Specify one or columns as headings
Both /hb Specify both rows and columns as headings
None /hn Remove headings

Name /ns List all names of cells or cell blocks

Join /js List all links with other worksheets

Printer /oc Select printer type and set printing options

Utility Menu

Status /us Display memory usage

Prefix /up Define a common prefix for all filenames

CLI /cli Open a CLI window on the worksheet

Auto Menu

Lists user defined autos

/AUTO

What it Does

- Creates and edits an auto command assigned to a special key
- Lists all auto commands assigned to special keys
- Deletes an auto command

How it Works

With this command you can create a sequence of commands and data entries and assign it to a key on your keyboard. Then, when you press that key, Superplan will automatically perform the entire sequence. Such a sequence is called an **auto**.

The prompt line displays the main options:

AUTO: Show Edit Delete Help(F1)

Displaying all Current Autos

To display a list of all the current autos, select **Show**. Superplan immediately replaces the worksheet by a table showing each auto key, the label associated with it, and the auto assigned to it. To return to the worksheet, press any key.

Creating an Auto

If you want to create a new auto, select **Edit**. Superplan first asks you to enter the auto key; this is the key to which you want to assign the auto. Either press one of the function keys *F5* to *F8*, or hold down the **ALT** key or the **CTRL** key and press an alphabetic key.

Note that on some systems, certain **CTRL** key combinations have functions that Superplan cannot alter (for example, **CTRL** and **M**, **H**, **I** or **S**). So you cannot use these as auto keys.

Next Superplan asks you to enter a label for the auto. A label may have as many as 15 characters. If you enter more, Superplan simply ignores the extra characters. When you have completed your auto label, press **↵**.

Now you can enter the auto itself. Simply type the sequence of commands and data entries just as if you were working directly with the worksheet. For example, if you wanted to create an auto for outputting a graph to a printer, you would enter:

/VP

for **/View Print**.

When you have completed the required sequence, press **↵**. Superplan assigns the sequence to your specified auto key, so that whenever you press the appropriate function key or press **ALT** (or **CTRL**) and the appropriate alphabetic key, the sequence is performed automatically.

Note that you may also run your autos by selecting them from the Auto menu. Superplan displays the labels for up to 10 autos as options on this menu. Selecting an Auto option has the same effect as pressing the key or keys for the auto.

Autos can be much more complex, of course, involving a number of different commands and the entry of data. In these cases, you may need to include non-alphanumeric keys, such as $_$ (to complete a data entry) or the arrow keys (to move the cell cursor).

However, you cannot include these in an auto simply by pressing them. For example, if you pressed $_$ in the middle of your sequence, Superplan would interpret it as the end of the sequence, not as the end of, say, a data entry.

So to include these kind of keys in your auto you must use instead the codes listed in the table below. You may enter them in upper or lower case, but you must always include the leading > character.

Key	Command	Function
$\rightarrow$	> MCR	Move cursor right
$\leftarrow$	> MCL	Move cursor left
$\uparrow$	> MCU	Move cell cursor up, or switch between insert and overwrite on entry line
$\downarrow$	> MCD	Move cell cursor down, or delete entry line character
HOME	> HOM	Move cursor to top left, or to start of entry line
END	> END	Move cursor to end of entry line
F9	> PGL	Move cursor left a page
F10	> PGR	Move cursor right a page
PAGE DOWN	> PGD	Move cursor down a page
PAGE UP	> PGU	Move cursor up a page
$_$	> ENT	Complete entry
ESC	> ESC	Cancel operation
BACKSPACE	> BAK	Delete character left
DELETE	> DEL	Go up one level
F1	> HLP	Get help
F2	> FIL	Display directory
ALT and A to Z	> ALTa	Call an auto ($a = A$ to Z)
ALT and 0 to 9	> ALTn	Call an auto ($n = 0$ to 9)
CTL and A to Z	> CTLa	Call an auto ($a = A$ to Z)
F1 to F10	> FUNn	Call an auto or execute a predefined function key ($n = 1$ to 10)

The above commands work in exactly the same way as their equivalent keys (or Control Panel buttons), which are all described earlier in this chapter. The following commands, however, do not have equivalent keys and so require more explanation:

> INP

This command makes Superplan wait until data is input by the user; the auto then continues with the next command. It should normally be followed immediately by an > ENT command. It displays:

Please type character(s), followed by ENTER

on the status line. The input data must be terminated by $\downarrow$. For example, part of a data entry screen may look like this, with the cursor in cell C1:

	A	B	C	D
1				
2	Enter first names:			
3	Enter surname:			
4				

The following auto:

> MCD > INP > ENT > MCD > INP > ENT

moves the cursor down to cell C2 and waits for input from the user. When the user presses $\downarrow$ the input data is entered in C2, then the cursor moves down to cell C3 and Superplan waits for the next input.

> MESmessage

This command displays the accompanying *message* on the prompt line. The *message* must be terminated by a \ (backslash) character, otherwise Superplan does not know where the *message* ends. You can use this command to display input prompts to the user, so it is often used in conjunction with the INP command. For example:

**= d2 > ENT > MESEnter your full name:
\ > INP > ENT**

moves the cursor to D2, displays the message 'Enter your full name:' on the prompt line, then waits for input from the user before continuing. Note that if you wish to make a \ (backslash) character appear in your message, type \\ (two backslashes).

> BEL

This command produces a beep from the keyboard. It is frequently used in conjunction with a message to prompt the user for input or to warn the user that an error has occurred.

For example:

> MESEnter filename\BEL > INP > ENT

displays a message on the prompt line, produces a beep from the keyboard, then waits for data to be input.

> KEY

This command makes Superplan wait until any key except ESC is pressed; then the auto continues. It displays:

Press any key to continue

on the status line, but like the > INP command, could be used in conjunction with a more explicit message to the user. For example:

> MESPRESS any key for next screen\ > KEY

displays a message on the prompt line, then waits until the user presses a key before continuing. Note that the key is not entered as a character; it is only used as an indication to Superplan to continue. If the user presses the ESC key Superplan exits the auto (unless the > EOF command is in force: see later in this guide).

> REP n

This command repeats the previous command n times, where n can be any number from 1 to 99. For example:

> MCD > REP10

moves the cursor down 11 rows.

> REW

This command repeats an entire auto or macro line. For example:

/B > ENT > MCR > KEY > REW

blanks the current cell, moves the cursor to the next column, waits for the user to press a key, blanks that cell, moves the cursor to the right again - and so on until the user presses the ESC key.

> RUN $range$

This command is used to run a macro, where the macro is in the specified *range* or starts at the specified cell reference. (For detailed information on macros see later in this booklet.) If you specify a range, Superplan performs all the commands starting at the top left-hand cell of the range; if you only specify a cell reference, it performs all the commands starting at the specified cell. For example, if you have the following macro:

	AAB	AAC	AAD
AAB	>MCR>INP>ENT		
AAC	>MCD>INP>ENT		
AAD	>MCR>REP2>INP>ENT		

then the auto > RUNaab1 performs all three lines.

- > IFF $\textit{filename}$ ** This command performs the same operation as the Dump option on the Graph menu. It stores the graph in the Graph window to a disk file in ILBM format. The *filename* specifies the name of the file and must end with a '\ ' character.
- > POFF%** This command turns off the help and prompt lines (the two lines above the entry line). It can be used with autos that do not require any input from the keyboard.
- > PON** This command turns on the help and prompt lines (the two lines above the entry line). It is used to restore these lines after they have been turned off with > POF.
- > WAI n** This command tells Superplan to wait n seconds before continuing with the auto, where n can be any number from 1 to 99. For example:
- /VS > WAI20 > ESC > ESC**
- displays a graph and leaves it on the screen for 20 seconds before returning to the worksheet.

Note that with macros Superplan also allows you to develop more sophisticated sequences of commands, in fact to write entire applications with customised user interfaces. Full details are given in Chapter 6.

Editing an Auto

To edit an existing auto, select Edit and enter the appropriate auto key. Superplan displays the auto label, which you may either accept by pressing $_$, or change by overwriting a new one.

Then the auto itself is displayed, which you can edit with the help of the following entry line cursor control keys:

- $\leftarrow$ Moves the cursor to the left.
- $\rightarrow$ Moves the cursor to the right.

The following keys delete characters from the entry:

- $\downarrow$ Deletes the character at the entry line cursor.

Backspace Deletes the character to the left of the entry line cursor.

To change your entry, simply type the new characters. These are normally inserted in the entry at the position of the cursor. However, if you want your characters to overwrite the existing entry, press the $\uparrow$ key. To insert characters again, press the $\uparrow$ key again.

- $\uparrow$ Switches between insert and overwrite.

When you have edited the auto to your satisfaction, press $_$.

Deleting an Auto

To delete an auto, select **Delete**, then press the appropriate auto key. Superplan deletes the auto immediately.

Examples

To create an auto to add up all the values in the four preceding cells of a column, first enter:

/AE

then press the auto key, say *F5*. Then enter the auto label, say:

TOTAL **_**

The auto is as follows:

+sum(>MCU:>MCU>REP2)>ENT **_**

Note how the first **>MCU** code points to the bottom cell of the range to be added and the second **>MCU** code and **>REP2** code move the cursor to the top cell of the range. The **>ENT** code represents the final **_**.

The following example of an auto performs a common editing task. Suppose you wanted to change '1984' to '1985' wherever it occurred on the worksheet; the auto is:

/E>MCL>MCU5>ENT **_**

The **/E** invokes **/Edit**, the **>MCL** code moves the cursor to '4', the **>MCU** code switches to overwrite so that the '5' overwrites the '4', and the **>ENT** code enters '1985' in the cell.

Rules

1. An auto must be no longer than 254 characters. If you attempt to enter more than 254, Superplan ignores the extra characters.
2. To interrupt an auto during execution, press the **ESC** key. All other keys have no effect, unless the auto has stopped at a **>KEY** or **>INP** code.

/BLANK

What it Does

- Deletes the contents of a cell.
- Deletes the contents of a cell block.
- Resets the field formats of blanked cells to their default settings.

How it Works

The prompt line displays:

BLANK: Range (ENTER to blank current cell)

To blank the current cell, press **↵**. To blank a specific cell, type the cell reference or cell name, then press **↵**.

To blank a partial row, partial column or cell block, type the appropriate cell range or cell block name, then press **↵**.

The entire contents of blanked cells are deleted and their field formats are reset to their default settings.

Example

To blank the partial row C3:J3, type:

/Bc3:j3↵

Rules

1. Protected cells are not blanked. To blank a protected cell, you must first 'unprotect' it using the /Protect command (see later in this chapter).
2. Although the field formats of blanked cells are reset to their default settings, column, row and global format settings are unaffected.

/CALENDAR

What it Does

- Defines a calendar for the worksheet.
- Defines working and non-working days within each month.
- Defines working and non-working hours within each day.
- Defines the time units.

How it Works

The purpose of this command is to allow you to turn your worksheet into a giant wall planner, such that each column represents a particular time period (a half-hour, hour, day, week, month, quarter, half-year or year).

The prompt line displays:

CALENDAR: Options Link Edit Clear Help

To specify the time units, working week and calendar start date, select **Options**. To link the calendar to the worksheet, select **Link**. To edit the calendar, select **Edit**. To remove the calendar and its options from the worksheet, select **Clear**.

Selecting Calendar Options

If you select **Options**, Superplan replaces the worksheet by the calendar options. To change any of these options, first use the ↑ and ↓ keys to move the cursor to the required option. For the first two options, then press the space bar to cycle through the available alternatives:

Time units are	days
	months
	half-hours
	quarters
	hours
	half-years
	weeks
	years
Working week is	Monday to Friday (all Saturdays and Sundays automatically become non-working days)
	Monday to Saturday (all Sundays automatically become non-working days)
	All days

If you highlight the Calendar start date option, you can change the start date of the calendar from its default of 1st January 1984. You must enter the new date in the format shown on the status line, then press either ↑ or ↓, or ↵.

If you press ↵, the start date you have entered and the options you have selected will be saved with the worksheet when you save it on disk, and reloaded whenever you load the worksheet. If you press an arrow key, your start date is entered, but the options stay on the screen for you to change again

if you wish.

If you decide not to change any of the options, press ESC.

Linking the Calendar to the Worksheet

If you select **Link**, Superplan asks you to enter the 'link' date of your worksheet. As above, this must be in the format shown on the status line. It must also be the same as, or later than, the calendar start date. When you press **↵**, Superplan asks for the letter of the column to be assigned to this link date. Type the column letter, then press **↵**.

In effect what this does is to assign a date (and time, if you select time units of half-hours or hours) to each column of the worksheet, using the link date and column as a reference. These dates and times can then be accessed and displayed by the Calendar Functions (see earlier in this chapter).

Editing the Calendar

The first prompt line now displays:

CALENDAR EDIT: Month Day Help(F1)

If you select **Month**, Superplan replaces the worksheet by a monthly calendar. Non-working days are highlighted.

You can move the cursor from day to day using the following cursor control keys:

→	Move to next day
←	Move to previous day
↓	Move to next week
↑	Move to previous week
PAGE DOWN or >	Move to next month
PAGE UP or <	Move to previous month

You can also move the cursor directly to a particular day by typing **=** (equals), followed by the relevant date. The date must be entered in the format shown on the status line.

The purpose of the calendar is to tell Superplan which times and dates are to be used on your timesheet and which are to be omitted. For example, if you define a national holiday or all weekends as non-working days, then they are not included in the timesheet.

To change a day from working to non-working or vice versa, press the space bar. When you have made all the changes you require, press **↵**.

To change the working half-hours of a particular day, press **M** when the cursor is on the day, then use the **←** and **→** keys to move from one half-hour to another, and the space bar to make any changes. Press **↵** to accept any changes, and a letter **M** is displayed alongside the day to show that the day has been modified.

To edit the standard working day, select the **Day** option.

\Calendar

Note that if you enter a new calendar start date after you have edited the calendar, the editing you have performed is cancelled and the calendar reverts to its default state.

Clearing the Calendar

If you select **C**lear, Superplan asks you to confirm the command. To cancel the command and leave the calendar as it is, type **N**o. To remove the calendar from the worksheet, type **Y**es.

Example

To link a calendar to your worksheet at column B, starting on 1st August 1985, enter:

/CL1/8/85 _ B _

This has the effect of assigning 1/8/85 to column B, 2/8/85 to column C, 5/8/85 to column D, and so on. Note that all non-working days are ignored.

More information about how to use the calendar is given in Chapter 2.

/DELETE

What it Does

- Deletes one or more rows, starting at the current row.
- Deletes one or more columns, starting at the current column.

How it Works

The prompt line displays:

DELETE: Row Column Help(F1)

To delete one or more rows, select **Row**. To delete one or more columns, select **Column**. You are then asked to type the number of rows or columns you want to delete. Type the number (taking the current row or column as the first), then press **↵**. To delete only the current row or column, simply press **↵**.

The current row or column, and all the following rows or columns up to the number you specified, are deleted. All the following rows or columns are shifted left or upwards to close the gap.

When Superplan performs the deletion, it also automatically adjusts all the cell references (whether they are relative or absolute) throughout the worksheet so that they still refer to the correct cells. For example, if the contents of cell A5 move to cell A1 (as the result of a Delete operation), any references to cell A5 anywhere else in the worksheet are automatically adjusted to A1.

Examples

To delete columns B and C from the following:

	A	B	C	D	
1	10013	4	North	A	
2	20967	3	South	D	
3	15443	5	East	C	
4					

move the cursor to any cell in column B and type:

/DC2↵

The result is:

	A	B	C	D	
1	10013	A			
2	20967	D			
3	15443	C			
4					

and all references to cells in columns D onwards are moved up two letters: ie references to column D become references to column B, those to E become C, and so on.

Rules

1. Columns or rows containing protected cells cannot be deleted.
2. Take care not to delete columns or rows containing cells referred to by expressions elsewhere in the worksheet.
3. The data in deleted columns or rows cannot be retrieved. The columns or rows may be re-inserted using the /Insert command, but they will not contain the original data.

/EDIT

What it Does

- Allows you to edit the contents of the current cell.

How it Works

The entry line displays the contents of the current cell, together with the leading data type character: +, -, <, etc. The entry line cursor is at the end of the entry.

The following keys now move the entry line cursor:

- ← Moves it to the left
- Moves it to the right.

The following keys delete characters from the entry:

- ↓ Deletes the character at the entry line cursor.
- Backspace Deletes the character to the left of the entry line cursor.

To change your entry, simply type the new characters. These are normally inserted in the entry at the position of the cursor. However, if you want your characters to overwrite the existing entry, press the ↑ key. To insert characters again, press the ↑ key again:

- ↑ Switches between insert and overwrite.

Example

The current cell contains an invalid time command, which because it is invalid, has been displayed in the cell as text. Type:

/E

to display it on the entry line:

"AUDIT",A5,10

It is invalid because a comma has been omitted between the " and the **A5**. To correct it, use ← to move the cursor to the A of A5, then type the comma.

To ensure that Superplan treats the entry as a time command, you must precede it by a < character, so use HOME to move the cursor back to the very first " character, press ↑ to switch to overwrite, then type <. Your entry should now look like this:

<"AUDIT",A5,10

To move the edited entry back to the current cell, press ↵. You will then see that the status line confirms that this is a time command.

Rules

1. You cannot edit an empty cell.
2. Be careful when inserting characters in a long entry that the entry does not exceed 254 characters. Any characters after the 254th will be ignored.

/FORMAT

What it Does

Defines the format in which data is displayed and printed, and the colour:

- throughout the worksheet
- throughout a column or columns
- throughout a row or rows
- in a specified cell block
- in the current cell

How it Works

The prompt line displays the available options:

FORMAT: Global Column Row Field Options Help(F1)

Global allows you to define the format for all the cells in the worksheet.

Column allows you to define the format for all the cells in a specified column or columns. If you want to format a particular column, enter the column letter and press **↵**. If you want to format the current column and one or more columns to the right, enter the total number of columns and press **↵**. If you want to format only the current column, simply press **↵**.

Row allows you to define the format for all the cells in one or more rows. If you want to format the current row and one or more rows below it, enter the total number of rows and press **↵**. If you want to format only the current row, simply press **↵**.

Field allows you to define the format for a cell block. Enter the name or range of the block, then press **↵**. If you want to format only the current cell, simply press **↵**.

If successive formatting commands result in a conflict of formats for a given cell, Superplan obeys the format settings at the different levels in the following order of priority:

- 1 Field
- 2 Row
- 3 Column
- 4 Global

Thus, the format settings for a particular row, for example, override those for the entire worksheet.

Options temporarily overwrites the worksheet by the colour options for the different elements: cursor, global, row, column, field, protected cells, and headings. To change a colour, use the arrow keys to highlight the appropriate element, then press the space bar to cycle through the available colours. When you have selected all your colours, press **↵**. To tell Superplan to ignore any changes you have made, press **ESC**. To clear all colours, press **DEL**.

If you select the **Global**, **Column**, **Row** or **Field** option, Superplan temporarily overwrites the worksheet by the current format settings at this level. As a reminder, the level is displayed on the status line.

To change any of these settings, first use the arrow keys to highlight the appropriate line. Then either type a number or text entry, or press the space bar to cycle through the available alternatives. Where a number or text entry is required, terminate it either by pressing an arrow key (to keep the options on the screen), or by pressing **↵** to accept the options specified).

When you have specified all your options, press **↵** to tell Superplan to accept them. If at any time you decide that you do not want to change any of the options after all, press **ESC**.

In the following descriptions of the options, note that not all of them will necessarily appear. For example, because you cannot define the column width and the number of decimal places at row or field level, these options do not appear in the list of options at these levels.

Where the word 'default' appears for an option, it means that the format is defined at a higher level.

Column width

You may enter a number between 0 and 73 to specify the width of a column or columns. If you enter **D** (for Default) at column level, the width is defined at global level. The global default width is 8.

If you specify a width of 0, Superplan 'hides' the column(s). To make a hidden column reappear, you must specify the column letter when you re-enter /Format.

Decimal Places

To specify the number of decimal places within the column width, enter a number between 1 and 14, no greater than the column width. If you enter **D** (for Default) at column level, the number of decimal places is defined at global level. If you enter **F** (for Free format) Superplan attempts to display as many decimal digits as are entered.

Numeric Display

- | | |
|----------------|---|
| General | Numbers are displayed in normal decimal form, if they fit in the specified column width. Otherwise, Superplan attempts to display them in exponential form. This is the format used if all levels are set to default. |
| Integer | Numbers are displayed as integers. Decimal values of 0.5 or more are rounded up to the nearest integer; values of less than 0.5 are rounded down. No decimal points are displayed. |

Currency	Numbers are displayed with two digits after the decimal point. Decimal values of 0.005 or more are rounded up to the nearest second place decimal; values of less than 0.005 are rounded down.
Bars	The integer portions of numbers are displayed as asterisks. For example: 3.5 displays as three asterisks, 25 as 25 asterisks. This can be used to generate a simple bar graph of a range of values.
Exponential	Numbers are displayed in exponential form, ie as a power of 10 containing one significant digit to the left of the decimal point. For example, 196 is displayed as 1.96E2.
User Format	If you select this option, a further list of numerical format options appears on the screen, each of which may be changed to form eight pre-set user formats: Thousands. Commas or spaces may be inserted between 000s, (eg 56,238 or 56 238), or omitted (eg 56238). If commas are also used to indicate decimal points (see the /Global command), commas in thousands will be replaced by spaces. Floating currency. Each number may be preceded or followed by a currency symbol (eg £56238), or omitted (eg 56238). Currency symbol. All the major international currency symbols are available. Negatives. Negative numbers may be enclosed by parentheses; for example, (56238). In this case, positive numbers are shifted one place to the left so that they are still aligned. Negative numbers may be terminated by CR; for example, 56238CR. In this case, positive numbers are shifted two places to the left so that they are still aligned. The third option is that negative numbers are preceded by - signs, for example, -56238. Finally, for systems with colour, negative numbers are displayed in red. Blanks for zeros. Zero values may be displayed as blanks or as 0.
Justification	
Values	Numeric, date and textual values resulting from expressions may be formatted so that they are aligned at the right-hand side of each cell, the left-hand side, or the centre.
Text	Text may also be formatted so that it is aligned at the right-hand side of each cell, the left-hand side, or the centre.

Display Format for Dates and Times

These options govern the display formats for dates and times. Most international formats are available.

Colour

If the colour is specified, Superplan displays the relevant cell(s) in the colour defined by the Colour Options table. If the colour is default, the colour is that defined at the next highest level.

Rules

1. Format settings only define the way cell data is displayed and printed; they do not affect the cell values themselves or the cell contents.
2. Column width and the number of decimal places cannot be specified for individual cells or rows.
3. If a piece of text is too large for a cell, it is truncated on the right if it is left justified, on the left if it is right justified, and on both sides if it is centre justified. Note, however, that large text is allowed to overrun adjacent cells if they are empty.
4. If a numeric value is too large for a cell, it is truncated only if no significant information is lost. Superplan attempts to display all digits to the left of the decimal point, plus as many digits to the right of the decimal point as are specified in the format settings; it also attempts to display any exponent. If it fails to do any one of these, it fills the cell with > characters. For example, if you attempt to enter 10000 into a cell only three characters wide, it will display > > >.
5. If your format does not display every digit of each number (for example, if you are only displaying £s and pence, but have values with fractions of pence), you may find that calculations do not appear to 'add up' correctly. This is because Superplan performs calculations using the full values, not the values displayed. For example, the sum:

$$123.124 + 123.124 = 246.248$$

may appear as:

$$123.12 + 123.12 = 246.25$$

/GLOBAL

What it Does

Allows you to specify how the following operations are to be performed by Superplan:

- Definition of relative and absolute cell references
- Calculation of the worksheet.
- Availability of protected cells.
- Display of graph commands.
- Representation of decimal points.

How it Works

The screen displays a list of the currently selected global options and the prompt line displays instructions on how to change them.

Use the ↑ and ↓ keys to move the pointer to each of the options, then press the space-bar to cycle through the alternatives. When you have set the required options, press ↵.

If you want to reset them to their original or default values, press ESC. In the following descriptions, the original values are given first.

Adjust all cell references

Do not adjust cell references

Adjust lower case cell references only

Adjust upper case cell references only

This option governs the automatic adjustment of cell references following /Replicate, /Table Arrange and /Move operations. You may choose to adjust either all or only relative cell references, ie those in lower case. If you choose the latter, upper case references become absolute, i.e. they cannot be adjusted.

For example, if you replicate the following expression:

+SUM(a1:a4)

from cell A5 to cell B5, the contents of cell B5 become:

+SUM(b1:b4)

However, if you want cell B5 to contain exactly the same expression as A5, you can prevent the cell adjustment taking place by entering absolute cell references, ie by selecting the **Adjust lower case cell references only** or the **Do not adjust cell references** option. By using different combinations of Global option settings and the case of the cell references, you can determine whether cell references are adjusted in new expressions resulting from /Replicate command.

Note also that you can mix relative and absolute cell references in the same expression. For example, if you replicate the expression:

+SUM(A1:A4,a5)

from cell A6 to cell B6, the result is:

+SUM(A1:A4,b5)

Preserve cell case after adjustment

Change cell to upper case after adjustment

This option gives you further control over the adjustment of cell references following /Replicate, /Table Arrange and /Move operations. You may choose either to keep the cell references in upper or lower case, just as you entered them, or to convert all lower case references to upper case. If you choose the latter, you can use the preceding option to make them absolute cell references and thus protect them from any further adjustment.

For example, if you select the **Change cell to upper case after adjustment** option and replicate the expression:

+SUM(a1:a4)

from cell A5 to cell B5, the contents of cell B5 become:

+SUM(B1:B4)

If you also select the previous option **Adjust lower case cell references only**, these cell references are now absolute and can no longer be adjusted.

Manual recalculation (after ! key)

Automatic recalculation (after data entry)

This option determines when all the expressions in your worksheet are to be recalculated. Normally they are only recalculated when you press **F3** or the **!** key. However you can change this option so that they are recalculated every time new data is entered.

It is better to use manual recalculation while you are constructing your worksheet, since you will probably not want a complete recalculation until all your expressions have been entered. It is also better when you are using a very large amount of data, so that you do not have to wait for recalculation each time you enter new data.

On the other hand, automatic recalculation does have the benefit of keeping your worksheet up-to-date.

Calculate in natural order

Calculate row-by-row

Calculate column-by-column

This option determines the order in which the worksheet is recalculated. For row-by-row calculation, cells are evaluated from left to right along each row and from top to bottom of the worksheet, ie A1, B1, . . . A2, B2 . . . , etc.

For column-by-column calculation, cells are evaluated from top to bottom of each column and from left to right across the worksheet, ie A1, A2, .. B1, B2, .. and so on.

If a cell contains a reference to a cell that also has to be recalculated, then it should appear 'later' in the order of recalculation than the referenced cell, so that the referenced cell can be recalculated first. If it appears 'earlier', it will use the last value of the referenced cell, rather than the recalculated value; you may then have to recalculate again to obtain the correct value.

To avoid problems caused by 'forward' references, you can recalculate the expressions in the worksheet in the natural order, that is, in the order implied by the cell references. For example, if cell A1 refers to cell F9, which in turn refers to cell D3, then cell D3 is recalculated first, followed by cell F9, followed by cell A1.

However, with natural order recalculation you should take care to avoid 'circular' references, in which, for example, cell A1 refers to F9, which refers to D3, which refers back to A1.

Superplan automatically checks for circular references whenever you create a new expression in the worksheet. When a circular reference is detected, you are warned by a message on the status line.

If the circular reference was not intentional you should change your last entry. If, however, you intentionally introduce a circular reference, be warned that this may lead to diverging and therefore nonsensical results. If your circular reference is 'well-behaved', you will still have to recalculate the worksheet a number of times to see your results converge, since Superplan only recalculates each cell once.

Protected cells available

Protected cells not available

Normally you can move the cursor to protected cells just as if they were ordinary cells. However, if you select the latter option, you cannot move the cursor to protected cells; instead it skips over them.

Display graph commands

Hide graph commands

This option may be used to 'hide' your graph commands. If you want to print or look at your graph data without the graph commands, you can suppress them using this option. Note: hidden graph commands are **protected**.

Period for decimal point

Comma for decimal point

Normally a period is used to indicate the decimal point in numerical values. But you can change this option so that a comma is used instead. Note, however, that if you choose the latter, Superplan will not display commas to separate 000s (see the /Format command).

/HEADING

What it Does

- Reserves rows as permanent heading displays.
- Reserves columns as permanent heading displays.
- Removes permanent heading displays.

How it Works

The prompt line displays the available options:

HEADINGS: Horizontal Vertical Both None Help

Horizontal reserves the current row and the rows above it on the screen as horizontal headings.

Note: to get help you can press the *FI* key or ? key, or point to the **Help** option and press **↓**.

Vertical reserves the current column and all columns to the left of it on the screen as vertical headings.

Both reserves the current row, the rows above it on the screen, the current column and all columns to the left of it on the screen as horizontal and vertical headings.

None cancels all headings and returns the worksheet to its normal state.

When rows or columns are reserved as headings, they are highlighted and, in effect, joined to the row and column borders. They remain on the screen at all times, regardless of which part of the worksheet is being displayed. When the screen window scrolls up or down, horizontal headings remain stationary and do not disappear from the screen; when the window scrolls left or right, vertical headings remain stationary.

Examples

To reserve columns F and G as permanent vertical headings, scroll the screen window so that column F is at the left-hand edge of the screen. Move the cursor to any cell in column G, then enter:

/HV

To reserve columns B and C and rows 3 and 4 as headings, scroll the screen window so that column B is the left-most column and row 3 the top-most row. Move the cursor to cell C4, then enter:

/HB

To remove the headings, the cursor may be anywhere on the worksheet. Enter:

/HN

Rules

1. You cannot move the cursor to heading cells.
2. If you divide your screen into two windows (see the /Window command later in this chapter), heading rows or columns apply only to the window in which you specify them.

/INSERT

What it Does

- Inserts one or more empty rows at the current row.
- Inserts one or more empty columns at the current column.
- Copies expressions into the inserted rows or columns.

How it Works

The prompt line displays the available options:

INSERT: Row Column Help(F1)

If you specify **Row** or **Column**, Superplan asks you how many rows or columns you want to insert. Type the number and press **↵**. If you only want to insert one row or column, simply press **↵**. Next, Superplan asks you if you want to replicate all the expressions from the preceding row or column to the new rows or columns. Note that this does not occur if the preceding row or column is blank. You may answer **Yes** or **No**.

Superplan inserts the specified number of rows or columns. New rows are inserted at the position of the current row, and the current row and following rows are shifted downwards to accommodate them. If you asked for expressions to be replicated, they are replicated from the row preceding the current row.

New columns are inserted at the position of the current column, and the current column and following columns are shifted to the right to accommodate them. If you asked for expressions to be replicated, they are replicated from the column preceding the current column.

In both cases, cell references (whether relative or absolute) in expressions throughout the worksheet are adjusted to take account of the insertions. For example, suppose that as the result of an Insert operation, the contents of cell A1 move to cell A5. Then any references to cell A1 anywhere else in the worksheet are automatically adjusted to A5.

Examples

To insert two blank columns between columns B and C, move the cursor to a cell in column C and type:

/IC2 ↵↵

To insert three rows between rows 10 and 11, and replicate the expressions from row 10, move the cursor to a cell on row 11 and type:

/I 3 ↵Y

Rules

1. If the rows or columns to be pushed off the edge of the worksheet by an insertion contain cells referred to by expressions elsewhere in the worksheet, the insertion is aborted.

/JOIN

What it Does

- Links data from two different worksheets by copying or adding the data from a cell or cell block in a worksheet disk file into the current cell or into the block starting at the current cell.
- Makes specified copying links permanent.
- Lists all permanent links.
- Allows you to defer specified copying operations.

How it Works

The prompt line displays the available options:

JOIN: Show Add Delete Help(F1)

Creating a Link

To create a link at the current cell, select the **Add** option. Superplan displays:

ADD: Consolidate Overwrite Subtract Proportion Help

If you wish to consolidate the data from a worksheet disk file with the data on screen, select the **Consolidate** option. The effect of consolidation is to add the values from the worksheet on disk to the values of the worksheet on screen.

If you wish to overwrite the data on screen with the data from a worksheet disk file, select the **Overwrite** option.

If you wish to subtract data from a worksheet disk file from the data on the screen select the **Subtract** option.

Should you wish to divide the data on screen by data in a worksheet disk file, select the **Proportion** option.

You must then specify the name of the disk file from which you want to obtain data. There are three ways in which you can do this:

1. Type the filename, then press **↵**. For more information on filenames, see the **Entering Filenames** section earlier in this chapter. Note also that you can specify a common prefix for your files; see the **/Utilities Prefix** command later in this chapter.
2. If you wish to use the current link file (ie the last file you used in a **/Join** command), simply press **↵**; the name of the file is displayed on the status line.
3. If you wish to see a list of the files on your disk, press the **F2** key. You may then select a file by using the arrow keys to highlight it; then press **↵**.

Superplan then asks you to enter the name of the cell or cell block within the link file. Note: it must be a name, not a cell reference or cell range (see the **/Name** command further on in this chapter). Type the name, then press **↵**.

You must then decide whether the link is only to be performed once, or the link between the current cell and the disk file is to be permanent. If you select **Yes**, the link will be in effect whenever you load the current worksheet. If you select **No**, the consolidation or overwrite is performed immediately, then the link is deleted.

Finally, if you specified a permanent link, Superplan asks you if you want to perform it now or later. If you select **Yes**, the consolidation or overwrite is performed. If you select **No**, it is deferred until you next perform a /Join command and list the permanent links, when Superplan will remind you that the consolidation or overwrite has not yet been performed.

Deleting a Link

To delete a link at the current cell, select the **Delete** option. The link is deleted immediately. Note, however, that the linked data is not deleted, ie the cells are not blanked.

Listing all Links

To list all the existing links in the worksheet, select the **Show** option. All the permanent links (including those made in previous Superplan sessions) are displayed on screen, temporarily overwriting the worksheet. The first column lists the cells that have links with other files, while the second column lists the filenames and the names of the linked cells within them.

Any link that has not yet been performed is indicated by the words:

is not yet loaded

The prompt line displays:

JOIN: Load unresolved links? No Yes Help

If you select **No**, the links are deferred until the next time you decide to list all the permanent links. If you select **Yes**, all the deferred links are performed.

Examples

As an example of a consolidation, suppose you have three worksheet files, JAN, FEB and MAR, containing the sales figures for three months, and you want to consolidate them into a worksheet showing the total figures for the quarter. The relevant parts of the monthly worksheets look like this:

	A	B	C	D
10		Area 1	Area 2	Area 3
11	Value	£11,233	£45,349	£10,992
12	Quantity	144	568	128
13				

	A	B	C	D
10		Area 1	Area 2	Area 3
11	Value	£9,555	£987	£6,856
12	Quantity	112	13	75
13				

	A	B	C	D
10		Area 1	Area 2	Area 3
11	Value	£19,545	£25,221	£15,886
12	Quantity	216	266	178
13				
14				

while the quarterly worksheet (on screen) looks like this:

	I	J	K	L
1		Area 1	Area 2	Area 3
2	Value			
3	Quantity			
4				
5				

To consolidate the three monthly sets of figures you must first 'name' the range B11:D12 in each monthly worksheet (see the /Name command later in this chapter). Suppose you name it SUBTOTALS in each case.

Now you can create the necessary links. Move the cursor to cell J2 and enter:

```
/JACjan _
SUBTOTALS _
YY
```

This creates a permanent link with the JAN file and performs the consolidation. To consolidate the other two files, enter:

```
/JACfeb _
SUBTOTALS _
YY
```

```
/JACmar _
SUBTOTALS _
YY
```

The final result on screen is as follows:

	I	J	K	L
1		Area 1	Area 2	Area 3
2	Value	£40,333	£71,557	£33,734
3	Quantity	472	847	381
4				
5				

That is, instead of overwriting the existing data with each /Join command, Superplan adds the linked data to the existing data.

As an example of overwriting, suppose you have two files: MONTH and YEAR. Part of the MONTH worksheet is shown on the next page.

	A	B	C	D
1	1412	112	22	January
2	1312	122	27	February
3	1256	121	24	March
4	1322	122	23	April

while part of the YEAR worksheet looks like this:

	G	H	I	J
22	443			
23	452			
24	445			
25	456			

To copy the contents of the partial column D1:D4 from MONTH into the partial column J22:J25 of YEAR, you must first 'name' the partial column in MONTH. Suppose you name it TOTALS.

Next you must save MONTH on disk, clear the spreadsheet and load YEAR. Move the cell cursor to cell J22 and enter:

```
/JAOmonth _
TOTALS _
YY
```

The MONTH worksheet file remains unchanged, while the YEAR worksheet now looks like this:

	G	H	I	J
22	443			January
23	452			February
24	445			March
25	456			April

Rules

1. Cells that contain linked data are protected (see the /Protect command), and remain protected even after the link is deleted.
2. In the case of cells containing expressions, only the current values are copied, not the expressions.
3. Link files must be Superplan files. You cannot link files in other formats.

/KRITICAL

What it Does

- Displays the critical path (with or without floats) through all or part of a Critical path analysis.

How it Works

A critical path analysis is particularly useful for time-based activities such as projects, in which the start of one job depends on the completion of one or more previous jobs.

In Superplan this type of dependency must be defined by the **AFTER** Time Function (see earlier in this chapter), which returns the number of the column immediately following the completion of a particular job. Without this function Superplan cannot calculate the critical path, so before you attempt to use **/Kritical**, you should ensure that the start dates of all dependent jobs in your project are defined by **AFTER** functions.

The **/Kritical** command allows you to see the critical path through your project, ie the tasks on which the timely completion of the project ultimately depends.

The prompt line displays the available options:

KRITICAL: Path Free float Total float Range Clear HELP(F1)

If you select **Path**, **Free float** or **Total float**, Superplan displays all the jobs that lie on the critical path in the following form:

◀=====Task Name=====▶

Jobs that do not lie on the critical path remain in the normal job display format. However, if you select **Free float** or **Total float**, any job that has a 'float' is displayed in the following form:

◀=====Task Name=====▶.....▶

with the float shown as a dotted line. The 'free float' for a job is the amount of time between the end of the job and the start of the next dependent job linked to it by an **AFTER** function. The 'total float' is the amount of time by which the job can be extended before it affects the completion date of the project.

If you select **Range**, Superplan asks you to specify the cell range in which Superplan is to look for the critical path. This becomes the current critical path range and is displayed on the status line whenever you use **/Kritical**. All other jobs outside the current range are ignored. If no range is specified, Superplan looks at the entire worksheet.

In addition to showing the critical path range, the status line also shows the type of critical path active, that is, **Path** only, **Free float** or **Total float**.

To clear a critical path, select **Clear**.

Notes

1. More information about critical path analysis is given in Chapter 2.

/LOAD

What it Does

- Loads a Superplan worksheet file from disk.
- Loads only the worksheet options and global, column and row format settings.
- Loads only the cell data and cell format settings.
- Loads data files created by other programs.

How it Works

The prompt line asks you to select the type of file to be loaded:

Superplan	Superplan worksheet file
Logistix	Logistix worksheet file

1-2-3	Lotus 1-2-3 file (with expressions; see Appendix B)
Text	Text file, such as WordStar (into column A of worksheet)
CSV	Comma Separated Value file (into separate cells)
DIF	Data Interchange Format file

Then Superplan asks you to enter the name of the disk file you want to load. There are three ways in which you can do this:

1. Type the filename, then press **↵**. For more information on filenames, see the **Entering Filenames** section earlier in this chapter. Note also that you can specify a common prefix for your files; see the **/Utilities Prefix** command later in this chapter.
2. If you wish to use the current file (ie the last file you used in a **/Load** or **/Save** command), simply press **↵**; the name of the file is displayed on the status line.
3. If you wish to see a list of the files on your disk, press the **F2** key. You may then select a file by using the arrow keys to highlight it; then press **↵**.

In the case of a Superplan file, the prompt line then displays:

LOAD: All Cells Options Location Help

To load everything from the file, select **All**. The following are loaded into the worksheet on screen:

Cell values	Cell protections
Cell contents	Windows
Format settings	Current graphics range and windows
Global options	Current critical path range
Headings	Calendar and calendar options
Autos	Names of cells and cell blocks
Cell and cell block names	Links with other worksheet files

Anything that has already been specified is overridden by the loaded file. Any data that has already been entered is overwritten by that from the file, except where the file cells are empty.

To load only the cell data and cell formats, select **Cells**. This option could be useful if you wanted to consolidate a number of files into a single worksheet. You could create your files in such a way that the data in each one occupied separate areas of the worksheet. You could then load them one by one into a single worksheet; the overall worksheet format and options would remain the same.

To load everything except the cell data and cell formats, select **Options**. This option could be useful if you needed to create a number of files with similar kinds of data, for example, sales figures for every month of the year.

Alternatively, you can create Superplan files that consist only of formats, calendars, global options, etc, to act as masks for other files. Then, when a file is loaded, a Superplan mask file can also be loaded to force the data into a predetermined format. This is particularly useful when using other than Superplan files.

In the case of Ashton-Tate dBase files and CSV files, once you have specified the filename, Superplan asks you if you want to load the file so that records occupy rows or columns. The latter option is useful if you want to produce graphical representations of your data, since it avoids the necessity of having to rotate your data using the /Replicate Orthogonal command.

If you wish to load worksheet files from Lotus 1-2-3 (extension .WKS) or Symphony (extension .WRK) choose the 1-2-3 option. Note that Superplan loads all formats, column widths and expressions into the Superplan worksheet, and where expressions are different in Superplan, it translates them. If the file from the other program includes expressions which do not have Superplan equivalents (e.g. @VAR), they are loaded as text for you to edit.

Examples

To load all of the file SALES.SPP, which looks like this:

	A	B	C	D
1	£1495	£122	£23	£1563.6

into the current worksheet, which looks like this:

	A	B	C	D	E
1	1497.3	677			
2	1744.2	544			
3	1322.5	433			

/Load

type:

/L sales

The result is:

	A	B	C	D
1	£1497.3	£677		
2	£1744.2	£544		
3	£1322.5	£433	£23	£1569.6

Cells A3 to D3 are overwritten; the widths of the columns are changed; and the values in cells A1 and A2 are displayed according to the new format.

If you had typed:

/L sales C

(to load the cells only) the result would have been:

	A	B	C	D
1	1497.3	677		
2	1744.2	544		
3	1322.5	433	23	1569.6

If you had typed:

/L sales O

(to load only the options and format settings) the result would have been:

	A	B	C	D
1	£1497.3	£677		
2	£1744.2	£544		
3	£1322.5	£433		

/MOVE

What it Does

- Moves the current row or column to another position.

How it Works

Superplan gives you the option of either moving the current row, the current column, or a range. To move the current row or column type the destination row number or column letter at the prompt line and press **↵**.

To move a range the prompt line asks you first for the cell or cell block to be moved, and then for the cell reference to which it should be moved. (The command syntax or format is the same as for replicating a cell or cell block. See page ####.)

When Superplan moves the the current row or column to its new position and all the intervening rows or columns (including any consisting entirely of empty cells) are shifted to accommodate them. When moving a range, all the cells in a destination area, except protected cells, will be overwritten by the corresponding cells of the source area.

All cell references in expressions throughout the worksheet are adjusted to take account of the move. For example, suppose that as the result of a /Move operation, the contents of cell A1 move to cell A5. Then any relative references to cell A1 anywhere else in the worksheet are automatically adjusted to A5.

Examples

To move column B to column E:

	B	C	D	E	F	A
1	North	677	17	2134.1		A
2	South	544	20	1896.4		A
3	East	122	23	1569.6		C
4						
5						

move the cursor to a cell in column B and enter:

/Me ↵

The result is:

	B	C	D	E	F	A
1	677	17	2134.1	North		A
2	544	20	1896.4	South		A
3	122	23	1569.6	East		C
4						
5						

/NAME

What it Does

- Allocates names to cells or cell blocks, which may be used instead of cell references or ranges.
- Deletes names.
- Lists all current names.

How it Works

The prompt line displays the available options:

NAME: Show Add Delete Help(F1)

Adding a New Name

To add a new name, select **Add**. Type the name you want to add, then press **↵**.

Enter the reference or range of the cell or cell block to be named, and press **↵**. If you want to name the current cell, you need only press **↵**. Superplan automatically adds the name to its list of names.

Note that the name is not displayed anywhere on the worksheet, however, you can easily create a text cell at the appropriate place in the worksheet and enter the name in it. For example, if you named a partial column of cells **TOTALS**, you could put the same heading at the top of the column.

Since you may use a name instead of a cell reference or range, names are often a more convenient and understandable way of manipulating data on a worksheet.

Deleting a Name

To delete a name, select **Delete**. Type the name to be deleted, then press **↵**.

Listing All Existing Names

To display a list of all existing names, select **Show**. Superplan temporarily overwrites the worksheet with two columns, the first column containing cell references and ranges and the second containing their names. You may press any key to return to the worksheet.

Examples

To give columns A to X of row 32 the name 'Sales Figures', enter:

/NASales_Figures ↵ a32:x32↵

Note that the **_** (underline) character must be used instead of a space.

To give block a12:g24 the name 'SUMMARY', enter:

/NASUMMARY ↵ a12:g24↵

Rules

1. A name must only consist of the characters A...Z, 0...9 and _ (underline). There must be no embedded spaces.
2. A name must start with an alphabetic character.
3. A name must not have more than 14 characters.
4. In a name, upper case characters are the same as lower case, eg 'Sales', 'SALES' and 'sales' are the same name.
5. A particular cell or cell block may have more than one name.
6. When defining the cell or cell block to be named, you must only enter a cell reference or cell range; you must not try to define it with another name, even if such a name already exists.
7. Named ranges are automatically adjusted following a /Delete, /Insert or /Move, but not after a /Table Arrange or /Replicate operation.
8. Names created by the /Name command must not be confused with job names.
9. Names must be used when defining cells to be linked by the /Join command.
10. A name may be used whenever Superplan asks you to enter a cell reference or range.

/OUTPUT

What it Does

- Outputs the data from the current worksheet to a disk file or printer.
- Outputs a particular block of data or what is on the screen.
- Outputs running headings.
- Outputs the data with or without the worksheet borders.
- Selects the printer type and sets the printing options.
- Selects horizontal or rotated printing.

How it Works

The prompt line displays the main options:

OUTPUT: Printer Disk Configure Help(F1)

To print your data, select **Printer**. To output it to a disk file, select **Disk**. To select the printer type and set the printing options, select **Configure**.

Outputting to a Disk File

If you select **Disk**, Superplan first asks you to enter the name of the file to which the data is to be output. You may do this in one of three ways:

1. Type the filename and press **_J**. For more information on filenames, see the **Entering Filenames** section earlier in this chapter. Note also that you can specify a common prefix for your files; see the **/Utilities Prefix** command later in this chapter.
2. If you wish to use the current file (ie the last file you used in a **/Output** command), simply press **_J**; the name of the file is displayed on the status line.
3. If you wish to see a list of the files on your disk, press the **F2** key. You may then select a file by using the arrow keys to highlight it; then press **_J**.

If the file already exists, Superplan asks you if you want to continue, to which you answer **Yes** or **No**. If you continue, the existing file will be overwritten by the data you are about to output. If you select **No**, the operation is aborted.

Next you must decide whether the output is to be **Unformatted** or **Formatted**. If you wish to print the file later using the existing printer control codes, select **Formatted**. However, if you want to process the file further (for example, to incorporate it in a report), you should select **Unformatted**. You will find that the file's format is acceptable to most editors and word processors.

From now on, the procedures for outputting to a disk file are exactly the same as those for outputting to a printer.

Outputting to a Printer

If you select **Printer**, Superplan asks you if you want to output a particular block of data, only what is on the screen, or all of the worksheet.

If you select **Screen**, Superplan prints or files exactly what is displayed on the screen, except for the status, prompt, help and entry lines.

If you select **Range**, Superplan asks you to enter the cell range of the block to be output. Enter it and press **↵**.

If you select **All**, Superplan prints or files the entire worksheet.

Next you are asked if you want to include the borders in the output:

**OUTPUT BORDERS: No Borders Row Borders Column Both
List Help(F1)**

To include or omit borders, select **No Borders**, **Row Borders**, **Column Borders** or **Both**.

In each of these cases, you may specify one or more rows from the top of the cell block to act as headings for your data. Type a number and press **↵**. For example, if you type 3, and your output block is g15:j230, then rows 15, 16 and 17 will be treated as headings. They will be output at the top of each page, just below the column border if it is present. If you do not want any headings, simply press **↵**.

To output a list of cell formulas and values, select **FBLDist**.

Superplan then prints the data or outputs it to the disk file. The printed output is created according to the printer options you have set (see below). The disk file is created in exactly the same form as if being printed according to the printer options you have set.

Setting printer options

If you select the **Configure** option, Superplan temporarily overwrites the screen with the printing options. If you wish to select new options, use **↑** and **↓** to highlight the relevant option, then either type the appropriate entry or press the space bar to cycle through the available alternatives.

When entering a number, terminate your entry by pressing **↑** or **↓**, so that the printer options remain on the screen.

If you decide not to make any changes to the printer options, press **ESC**. If you do want to use the new options, press **↵**. Superplan then asks:

OUTPUT CONFIGURE: Update parameter file? No Yes Help

To set these options for every Superplan session, select **Yes**; to set them only for this session, select **No**.

Printer selected	From the printers listed, you should select the one connected to your system, or one that is compatible with it.
Print mode is	If you wish to print your data horizontally, ie row by row across the page, select the Horizontal option. This option should be chosen if each row of data is

	short enough to fit across the page. However, if your rows of data are too long for horizontal printing, select the Rotated option. Your rows of data are then printed sideways down the paper.
Paper length	Enter the length in mm of your paper. If you specify 0, Superplan assumes you are using continuous stationery and will not make any page breaks.
Paper width	Enter the width in mm of your paper.
Text mode is	From this you can select the typeface you require and the print density.
Date and time	If you require the date and time in the top margin of each page, you can specify their position.
Page number	If you require the page number in the margin bottom margin of every page, you can specify its position.
Pause	If you are using continuous stationery, pages or a sheet feeder, select NO. If you need to feed paper one page at a time, select YES. To force a new page, enter: '! _' in column A. This produces a row of ! characters at the point at which Superplan is to start a new page. The row of ! characters is not printed.
Printer output	(consult your computer documentation)
The default entries for the following options are automatically set when you select the above options, so you need only change them if you want to produce a particular effect.	
Characters/line	This is the maximum number of characters that can be printed on one line. If you divide the number of characters per line by the number of characters per inch (or mm), you will obtain the width of your printout. For example, 80 characters per line at ten characters per inch gives an 8-inch wide printout.
Lines per page	This is the maximum number of lines of data on each page. The line density is determined by your printer; for horizontal printing it is usually six lines per inch. Thus, 66 lines per page is the correct setting for 11-inch paper.
Top margin	This is the number of lines that will be left blank at the top of each page.
Bottom margin	This is the number of lines that will be left blank at

the bottom of each page. For example, with 66 lines per page, a top margin of three and a bottom margin of two, the number of lines of printed data on each page will be 61.

- Initialisation** Not normally required (if in doubt, consult your printer documentation) (^ for CTRL)
- Termination** Not normally required (if in doubt, consult your printer documentation) (^ for CTRL)

Example

You want to print the first 200 rows of the first ten columns of your worksheet, with row numbers, 50 rows to a page. First enter:

/OC

to display the printer options. If your columns are all eight characters wide, you must change the characters per line to at least 93: 80 for the columns, ten for the spaces between them and three for the row numbers. At a print density of ten characters per inch, you will need paper at least ten inches wide (allowing for left and right margins).

If your paper is 11 inches long and the line density is six lines per inch, leave the number of lines per page as 66. Leave the number of top margin lines as three, but change the number of bottom margin lines to 13 ($66 - 3 - 13 = 50$).

To perform the print so that the first two rows of data are used as headings on each page, enter:

/O _ Ra1:j200 _R2 _

/PROTECT

What it Does

- Protects a cell or cell block from alteration.
- Protects all non-empty cells or only those containing text or expressions.
- Removes protection from a protected cell or cell block.

How it Works

The prompt line displays:

PROTECT: Protect Unprotect Help

Protecting Cells

To protect a cell or cell block, select **Protect**. The prompt line displays:

PROTECT: Range (ENTER for current cell)

Protecting a cell means preventing it from being changed. You cannot enter new data into a protected cell, /Blank it or /Delete it. You can remove protection from a cell only by using **Unprotect**. Note that hidden graph commands (see the /Global command) and data joined to the worksheet by the /Join command are automatically protected.

To protect the current cell, press **↵**; Superplan protects the cell immediately and displays a P in the status line after the cell type. For example:

A19(NMBR,P) = 123

To protect a cell other than the current cell, enter the cell reference and press **↵**. To protect a cell block, enter the cell range or name and press **↵**. Superplan displays:

PROTECT: All Expressions/text Help

To protect all the non-empty cells in your specified block, enter **All**. To protect all non-empty cells except those containing numbers, enter **Expressions/text**: this is a good way of keeping expressions, commands and headings safe, while still allowing numbers to be entered.

By selecting the /Global option **Protected cells not available**, you can prevent the cursor moving to protected cells, just as if they were headings. Instead, the cursor skips over them.

Unprotecting Cells

To remove protection from a cell or cell block, select **Unprotect**. The prompt line displays:

UNPROTECT: Range (ENTER to unprotect current cell)

To remove protection from the current cell, press **↵**. To remove it from a particular cell, enter the cell reference and press **↵**. To remove it from any protected cells in a particular block, enter the cell range and press **↵**.

Unprotect simply reverses the effect of **Protect**, and allows cells to be changed. It has no effect on cells that are not protected.

Example

To protect everything except the numbers in the cell block A4:M82, enter:

/P ␣ a4:m82 ␣ E

Rules

1. Note that you can change protected cells by **/Joining** or **/Loading** data into them.
2. The **/Zap** command blanks all cells, including those that are protected.

/QUIT

What it Does

- Exits from Superplan to the operating system.

How it Works

Superplan asks you if you are sure you want to quit:

QUIT: No Yes Help(F1)

If you want to quit, enter **Yes**. Note that all your worksheet data will be lost unless you have saved it on disk using the **/Save** command. If the current worksheet was loaded from a file, Superplan displays a reminder on the status line if you have changed the worksheet in any way since it was loaded.

If you want to remain in Superplan, enter **No**.

Rules

1. Make sure you save your work before using **/Quit**, as there is no way of restoring it once you have quit Superplan.

/REPLICATE

What it Does

- Copies a single cell into another cell.
- Copies a single cell into every cell in a block.
- Copies a cell block into another block.
- Copies a partial row into a group of partial rows.
- Copies a partial column into a group of partial columns.
- Copies current values or automatically adjusts relative cell references in the copies, regularly or orthogonally.

How it Works

The prompt line displays:

REPLICATE: Regular Orthogonal Values Help(F1)

These options are explained later in this description; whichever you select, Superplan next displays:

REPLICATE: FROM(cell or range),TO(cell or range)

Enter the reference or range of the cell or block to be copied, then a comma, then the reference or range of the cell or block in which the copies are to be placed, then press **↵**. As with most slash commands, pointing may be used.

The contents and cell formats of the FROM cells are copied to the TO cells. In the case of FROM cells that do not contain expressions, the values of the cells are also copied; the various results of copying expressions are described later in this section. Anything already in the TO cells is overwritten, unless the cells are protected (see the /Protect command).

Single Cell into Single Cell

This is the simplest use of /Replicate. To copy from the current cell, you may omit the FROM reference and start with the comma. To copy to the current cell, you may omit the TO reference and press **↵** immediately after the comma.

Single Cell into a Block

In this case, the cell is copied into every cell of the block. To copy from the current cell you may start with the comma.

Cell Block into a Cell Block

To copy an entire cell block into a block of the same size, enter the TO range as the reference of the cell in its top left-hand corner (cell D1 in the example below). The result of the copy is as follows:

		D1	
1	4	1	4
2	5	2	5
3	6	3	6

Partial Row into Partial Rows

To make a number of copies of a partial row, the TO range must be the partial column containing the first cells in the partial row copies (range D1:D2 in the example below).

1	2	3	→	D1		
1	2	3		1	2	3
				1	2	3

Partial Column into Partial Columns

To make a number of copies of a partial column, the TO range must be the partial row containing the first cells in the partial column copies (range D1:E1 in the example below).

D1	
1	1
2	2
3	3

Regular Cell Adjustment

The powerful aspect of /Replicate is its ability not only to copy the contents of cells but also to adjust any cell references in copied expressions.

If you select **Regular** at the start of a /Replicate, column letters in relative cell references are adjusted according to the column positions of the copies, and row numbers according to the row positions. Absolute cell references are not adjusted.

For example, suppose you have two columns of figures to add up:

	A	B	C	D	E	F
1	22	54				
2	19	98				
3	21	52				
4	13	63				
5	24	14				
6	15	33				

and you want to place the results in cells A7 and B7. The expression for adding up the contents of cells A1 to A6 might be:

sum(a1:a6)

so this must be entered in cell A7. To replicate this to cell B7 enter:

/R ␣ a7,b7

The resulting expression in cell B7 is:

sum(b1:b6)

That is, Superplan has automatically adjusted the cell references to correspond to the new position of the expression: the column letter has been adjusted one column to the right and the row numbers have remained the same.

Now suppose you wanted to replicate the same expression in cell C20. The command is:

/R ␣ a7,c20 ␣

and the resulting expression in cell C20 is:

sum(c14:c19)

This time both the row and column references have been adjusted — the rows by 13 and the columns by two — so that the new expression still adds up the six cells above it.

Note: The value of the original expression is not copied in either of the above examples, instead Superplan automatically calculates the values of the adjusted expressions.

When you copy an expression from a single cell into, say, a column of cells, the effect is to 'ripple' expressions through the worksheet. For example, suppose you have two columns of figures

	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						
7	11	11				
8	12	12				
9	13	13				
10	14	14				
11	15	15				

and you want to add each pair of figures and put the results in column C. First, enter the appropriate expression in cell C2:

a2 + b2 ␣

Then replicate the expression into cells C3 to C6:

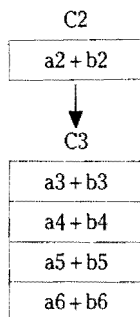
/R ␣ c2,c3:c6 ␣

/Replicate

The result is:

	A	B	C	D	E	F
1	11	11	22			
2	12	12	24			
3	13	13	26			
4	14	14	28			
5	15	15	30			

The cell references have been adjusted as follows:



As with the previous two examples, Superplan has automatically adjusted the cell references according to the positions of the copies, so that the expressions still perform the required calculations. All regular replications work in the same way.

Orthogonal Cell Adjustment

To illustrate orthogonal replication, consider what happens now when you replicate a single cell reference from one cell to another. For example, if cell A5 contains the expression:

a1

and you replicate it orthogonally to cell B5 using the command:

/ROa5,b5

the expression in B5 is:

a2

not **b1** as you would have expected with regular replication. This is because Superplan has 'inverted' the adjustment of columns and rows. Despite the fact that the expression has stayed on the same row but moved to the next column, Superplan has increased the row reference by one, but kept the column reference the same.

This feature is therefore particularly useful if you want to make columnar arrangements of data organised in rows, or row arrangements of data organised in columns. To illustrate this, consider the last example in the previous section. This time, however, you do not want the sums in a column, you want them in a row from cell C7 to G7. So enter the first expression in cell C7:

a2+b2 ↵

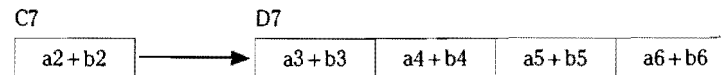
Then /Replicate it into cells D7 to G7, only this time selecting orthogonal replication:

/ROc7,d7:g7 ↵

The result is:

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

This time, the cell references have been adjusted as follows:



It is as if Superplan had turned the worksheet on its side to make the necessary adjustments: column letters have been adjusted according to the *row* positions of the copies, and row numbers according to the *column* positions.

Conversely, you could transform a row of data into a column for, say, a pie chart (see Chapter 4). For example, to use:

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							

as data for a pie chart, pull the first item of data into the appropriate row of column C by entering:

c1 ↵

in, say, cell C3. Then replicate it orthogonally into cells C4 to C7 by entering:

/ROc3,c4:c7 ↵

/Replicate

The result is:

	A	B	C	D	E	F	G
1			43	24	33	19	10
2			43				
3			24				
4			33				
5			19				
6			10				

and you can now enter the appropriate graph commands in columns A and B.

Note that as with regular replication, absolute cell references are not adjusted.

Replicating Values Only

If you select the **Values** option at the start of a /Replicate, only the current values of expressions are copied, not the expressions themselves, as in **Regular** or **Orthogonal** replication. For example, if you replicate the expression SUM(C1:C10) from one cell to another, only the current value of the expression appears in the TO cell, not the expression itself. This feature can be useful if you want to keep copies of certain results when you know that they may subsequently change.

Suppose you have the following worksheet:

	A	B	C	D	E	F
1	20	22	12	9	25	
2	45	66	47	24	98	
3	34	32	13	57	76	

and cell A4 contains SUM(A1:A3), cell B4 contains SUM(B1:B3), and so on. To copy the current results of these expressions to, say, cells A20:E20, enter:

/RVa4:e4,a20

The result is:

	A	B	C	D	E	F
20	99	120	72	90	199	
21						
22						

This option can also be used to copy the current values of expressions within time commands. For example, the following time command:

<14,c14*d14,after(b13,row-1)+3

has a current value of:

<"Axles",24,26

If you replicate it using the **Values** option, it will be copied in the form of its current value. This could be useful if you wanted to preserve an original job schedule in order to compare it with subsequent changes.

If you use the **Values** option on cells containing time or date values, the copies will be converted to pieces of text. If you copy cells containing text or graph commands, the copies will be the same as the original cells.

Note that in all **Values** replications, the copies will be protected if the original cells are protected (see the /Protect command earlier in this chapter).

Examples

To make a regular copy of cell A1 in cells A2 to A40, enter:

/R a1,a2:a40

To make an orthogonal copy of block A1:D2 in block F1:I2, enter:

/ROa1:d2,f1

To make three regular copies of partial row A1:C1 in A3:C3, A4:C4 and A5:C5, enter:

/R a1:c1,a3:a5

/SAVE

What it Does

- Saves a worksheet on a disk file.
- Saves everything, or only the cell values.
- Saves it as a Superplan, dBase, Lotus, CSV or DIF file.

How it Works

The prompt line asks you whether you want the worksheet saved as a Superplan, dBase, Lotus 1-2-3, CSV (Comma Separated Value) or DIF (Data Interchange Format) file. Superplan then asks you to enter the name of the file in which the worksheet is to be saved. There are three ways in which you can do this:

1. Type the filename, then press **↵**. For detailed information about entering filenames, see the Entering Filenames section earlier in this chapter. For information about specifying a common prefix for your filenames, see the /Utilities Prefix command later in this chapter.
2. If you wish to use the current file (ie the last file you used in a /Load or /Save command), simply press **↵**; the name of the file is displayed on the status line.
3. If you wish to see a list of the files on your disk, press the **F2** key. You may then select a file by using the arrow keys to highlight it; then press **↵**.

In the case of a Superplan file, you are then asked if you want to save everything or only the selective parts of the worksheet:

SAVE: All Selective Help(F1)

To save everything, select **All**. If the file already exists, Superplan asks you if you want to continue. If you select **Yes**, the existing information in the file will be completely overwritten by the worksheet data. If you select **No**, the Save operation is aborted.

If you choose the **Selective** option, the following menu will appear:

Text Cells: YES
Expressions: YES
Numeric Values: YES
Worksheet Format: YES
Autos: YES
Range Names: YES
Join Links: YES
Calendar: YES
Version 1.1 Compatible: NO

You may choose some or all of these options. The default option, in which all the items are selected except for the option to save in Version 1.1 format, has the same effect as using the **All** option.

If one or more of the first options are selected, (i.e. if any cells are being saved) the following menu will appear:

SAVE RANGE: All Left Boundary Range Help

where **Left** and **Boundary** refer to the cells to the left and to the right of and including the boundary, respectively.

The /Save dBase option provides you with the choice of saving in either dBase II or dBase III formats. The difference between these formats is mainly internal but note that dBase III supports date fields whereas dBase II does not. Data must be arranged with each record occupying a partial row, with corresponding fields of each record in the same column. At the top of the data there must be a partial row of field names, which must be text cells.

Superplan uses the first row of data (immediately below the field names) to determine the type of data in each field. The column width and number of decimal places (set in /Format) for each column of data in Superplan determines the corresponding dBase field width and number of decimal places.

The length of the field name should not exceed the width of the field. Please ensure that you do not mix the data within a field, i.e. you do not have text cells within a numeric field.

If any of the above provisions are ignored Superplan will display the error message:

WRONG RANGE OR UNSUITABLE DATA

Where the Lotus 1-2-3 format option is selected Superplan converts all cells including functions etc. as closely as possible to their Lotus 1-2-3 equivalents. Where possible worksheet formatting information (e.g. column widths, cell protection) is also converted. Note that the files are written in Lotus Version 1 format.

After selecting one of the file types other than Superplan and entering the file name you will be prompted to enter the range to be saved. If you want to save the whole worksheet simply press **↵**.

Files created by /Save can be reloaded using /Load.

Examples

To save all of the worksheet in the Superplan file ACCOUNTS on the logged in drive, enter:

/S **↵ ACCOUNTS **↵****

To save the worksheet in the DIF file YEAR on drive DF1, enter:

/SDDF1:YEAR **↵**

/TABLE

What it Does

- Selects database records that match specified criteria.
- Selects specified fields of database records that match specified criteria.
- Deletes database records that match specified criteria.
- Sorts a block of partial rows into a particular order.
- Sorts all the rows in the worksheet into a particular order.
- Fills a cell block with a sequence of numbers.
- Automatically provides a table recording the effects of entering different values in each of up to two cells.

How it Works

The prompt line displays the main options:

DATA: Query Arrange Fill What-if Load Help(F1)

Select **Query** to find specific records in your database. Select **Arrange** to sort rows of the worksheet into order. Select **Fill** to fill a cell block with a sequence of numbers. Select **What-if** to generate a 'what-if' table. Select **Load** to load selected records from a dBase file..

Finding Database Records

The **Query** option allows you to select records from a database according to criteria that you specify. Full details of how to set up a database are given in Chapter 3. The prompt line now displays the query options:

Extract	Copies each selected record (or specified fields from each selected record) to another part of the worksheet.
Unique	The same as Extract , except that it does not copy a record more than once.
Find	Allows you to skip through the selected records.
Last find	Returns you to the last Find operation and the last found record.
Delete	Removes each selected record from the database, closing up the blank rows.

In the case of **Last find**, Superplan immediately returns to the last performed **Find** operation and highlights the last found record. This is particularly useful if you want to make a series of amendments to found records, since by using this option you do not have to enter all the **Find** options for every record.

In the case of the other options, Superplan first asks you for the **input range**. This is simply the block containing the database (or the part of it you want searched). Note that this block must have all the field names at the top of each column of the database. The last input range you entered is displayed on the status line. If you wish to use it again, simply press **↵**. Otherwise, enter the cell range or cell block name and press **↵**.

Superplan then asks for the **criterion range**. This is the part of the worksheet that contains the names of the fields you want Superplan to look at and the contents of those fields that you want the selected records to match. Note that any blank rows in the criterion range allow **all** records to be selected. The last criterion range you entered is displayed on the status line. If you wish to use it again, simply press **↵**. Otherwise, enter the range or name and press **↵**.

Finally, Superplan asks for the **output range**. This is only required for Extract and Unique operations and is the part of the worksheet where copies of the extracted records will be put. The first row must contain the names of those fields you want copied. The block must be large enough to contain all the records to be extracted; it must be currently empty or contain expendable data. The last output range you entered is displayed on the status line. To use it again, simply press **↵**. Otherwise, enter the cell range or cell block name and press **↵**.

If you specified **Extract**, copies of the specified fields of all the records that satisfy the selection criteria are placed in the output range.

If you specified **Delete**, Superplan asks you to confirm the deletion of all the records that satisfy the selection criteria. Remaining records move upwards to fill in the blank rows.

If you specified **Find**, Superplan highlights the first record that satisfies the selection criteria. The **↓** and **↑** then allow you to move to all the other selected records. The **←** and **→** keys allow you to move from field to field.

If you specified **Unique**, Superplan copies the specified fields of all the records that satisfy the selection criteria, ensuring that no two of the copied records are identical.

Sorting Rows

The **Arrange** option allows you to sort the rows of a cell block into ascending or descending order of the contents of a specified column. More detailed information is given in Chapter 3. The prompt line displays the options:

TABLE ARRANGE: Range All Help(F1)

The **Range** option asks you to enter the range to be sorted. To sort a particular block of partial rows, enter either the cell range or the cell block name and press **↵**. From now on, the prompts are exactly the same as for the **All** option. The **All** option asks you to enter the 'key' column. This is the column of values that is to be used to define the sort order. Type the column letter and press **↵**.

Now select **Ascending** or **Descending**. The ascending order for numeric values is 0, 1, 2, . . . The ascending order for text is:

- 1 Special characters (! @ etc)
- 2 Numeric digits
- 3 Lower case alphabetic characters
- 4 Upper case alphabetic characters
- 5 Graphics characters

/Table

When Superplan performs the rearrangement, it also automatically adjusts all relative cell references throughout the sorted block so that they still refer to the correct cells. For example, suppose that as the result of an Arrange operation, the contents of cell A1 move to cell A5. Then any relative references to cell A1 in the sorted block are automatically adjusted to A5.

To see how /Table Arrange works, consider the following block:

	A	B	C	D	
1	10013	4	19236	A	
2	20367	3	15660	D	
3	15443	5	16553	C	
4	14332	1	22112	B	
5	17765	2	20012	E	

To arrange it in descending order of column B, type:

/TA a1:d5 B D

The result is:

	A	B	C	D	
1	15443	5	16553	C	
2	10013	4	19236	A	
3	20367	3	15660	D	
4	17765	2	20012	E	
5	14332	1	22112	B	

It is unwise to sort on a column that contains a variety of different cell types and values, but should you decide to do so, Superplan sorts first according to the types of data, then according to the values. The ascending order of cell types is as follows:

- Text (including repeated text and graph commands)
- ERR (error) cells
- N/A (not available) cells
- Expressions (including numbers and dates)
- Time command cells
- Empty cells

Text cells are sorted into alphabetical and numeric order. Ascending order puts numbers above letters, descending order puts them below.

It is advisable to create a new column containing sequential numbers before you do a sort. You will then be able to use that column to sort the rows back into their original order. If you do not do this, the original state of the worksheet will be irretrievably lost.

To protect your data from unexpected changes during a sort, save it first on a disk (see the /Save command).

Protected cells and headings are not immune from /Table Arrange operations. If a protected cell is moved, the protection moves with it. If a heading is moved, only the cell itself moves; the heading row or column remains in the same place.

Make sure that your expressions still perform the required calculations after the cell references have been adjusted during a /Table Arrange operation. For instance, the expression SUM(d1:d20) may not be meaningful if these cells are no longer contiguous. If you are in any doubt, it is probably safer to ensure that all the relevant cell references are absolute cell references.

More information on sorting is given in Chapter 3.

Data Fill

The **Fill** option allows you to fill a cell block with an ascending or descending sequence of numbers. You can use this feature to number columns or rows, prepare values for a what-if table (see below), number records in a database, and so on.

Superplan first asks for the cell block that is to be filled. Enter the range or block name and press **↵**.

Superplan then asks in turn for the start value, the step value (ie the value by which the start value is to increase or decrease for each cell in the block), and the stop value. To enter a value, type the number and press **↵**. These values must be integers.

Superplan puts the start value in the top left-hand corner of the block, then goes down each column in the block, adding the step value to each cell, until the block is filled or the stop value is reached, whichever comes first.

What-if Table

The **What-if** option allows you to automate a series of 'What-if' recalculations by creating a table showing:

1. How the values of one or more expressions change according to changes in the value of a specified 'input' cell.
2. How the value of one particular expression changes according to changes in the values of two specified 'input' cells.

Superplan first asks you to select a single value table (1 above) or a double value table (2 above).

It then asks you to specify the table range, ie the block containing the table. A single value table should look like this:

Empty	Expr 1	Expr 2	Expr 3	Expr 4
Value1	Result1	Result2	Result3	Result4
Value2	Result5	Result6	Result7	Result8
Value3	Result9	Result10	Result11	Result12

with the expressions to be evaluated occupying the top row and the different values to be input occupying the left-hand column. Superplan puts the results in the positions shown. You should prepare this table before you perform the /Table What-if command.

1. Leave the top left-hand cell empty.
2. Place the values to be substituted in the input cell down the left-hand column. They may be numbers or expressions giving numeric values.
3. Place the expressions to be evaluated along the top row of the table. Alternatively, they may be simple references to cells containing the expressions to be evaluated. Each expression should depend on the value in the input cell. The expressions in the table must only contain absolute references to other cells. (Note that the visible values of the expressions in the table are their values resulting from the current value of the input cell.)

You are now ready to perform the /Table What-if Single-value command. First, Superplan asks you for the range or name of the block containing the table. The last table range you entered is displayed on the status line. If you wish to use it again, press **↵**. Otherwise, enter the table range or table name and press **↵**.

Next you must enter the reference or name of the input cell, that is, the cell in which the different values of the table are to be input. As above, the last input cell reference you entered is displayed on the status line. If you wish to use it again, simply press **↵**. Otherwise, enter the reference or name and press **↵**.

For each value of the input cell, Superplan automatically recalculates the entire worksheet, placing the results of your specified expressions in the results area of the table. When it has filled the results area it recalculates the rest of the worksheet one more time with the original value of the input cell.

A Double Value table should look like this:

Expr	BValue1	BValue2	BValue3	BValue4
AValue1	Result1	Result2	Result3	Result4
AValue2	Result5	Result6	Result7	Result8
AValue3	Result9	Result10	Result11	Result12

with the expression that is to be evaluated occupying the top left-hand corner. The first set of values to be input occupy the left-hand column and the second set of values occupy the top row. Superplan puts the results in the positions shown. You must prepare this table before you perform the /Table What-if command.

1. Put the expression to be evaluated in the top left-hand cell of the table. Alternatively, it may be a simple reference to a cell containing the expression to be evaluated. The expression should depend on the values in the input cells. The expression in the table must only contain absolute references to other cells. (Note that the visible value of the expression in the table is its value resulting from the current values of the input cells.)
2. Place the values to be substituted in the first input cell down the left-hand column of the table. They may be numbers or expressions giving numeric values.
3. Place the values to be substituted in the second input cell along the top row of the table. Again, these may be numbers or expressions giving numeric values.

You are now ready to perform the /Table What-if Double-value command. First, Superplan asks you for the range or name of the block containing the table. The last table range you entered is displayed on the status line. If you wish to use it again, simply press ↵. Otherwise, enter the table range or table name and press ↵.

Next you must enter the reference or name of the first input cell, that is, the cell in which the values down the left-hand column of the table are to be input. This must be followed by the reference or name of the second input cell, that is, the cell in which the values along the top of the table are to be input.

In both cases, the last input cell reference you entered is displayed on the status line. If you wish to use it again, simply press ↵. Otherwise, enter the reference or name and press ↵.

For each value of each input cell, Superplan automatically recalculates the entire worksheet, placing the results of your specified expression in the results area of the table. When it has filled the results area it recalculates the rest of the worksheet one more time with the original value of the input cells.

A detailed example of the use of a double-value What-if table is given in the TULSA example described in Chapter 5.

Loading Records from a dBase File

The Load option allows you to select records from an Ashton Tate dBase file according to criteria that you specify. Full details of how to use this command are given in Chapter 3. The prompt line now displays the two options:

TABLE LOAD: Extract Field headings Help

The Extract option allows you to load selected records from a dBase file into a part of the worksheet, in much the same way as /Table Query allows you to extract records from a worksheet database. Logistix first asks you for the dBase filename. There are three ways in which you can specify this:

1. Type the filename, then press **↵**.
2. If you wish to use the current file (i.e. the last file you used in /Table load command), simply press **;** the name of the file is displayed on the status line.
3. If you wish to see a list of the files on your disk, press the **F2 FILES** key. You may then select a file by using the arrow keys to highlight it; then press **↵**.

Superplan then asks for the **criterion range**. This is similar to the criterion range in a /Table Query operation. The last criterion range you entered is displayed on the status line. If you wish to use it again, simply press **.** Otherwise, enter the range name and press **↵**.

Finally, Superplan asks for the **output range**. Again, this is exactly the same as an output range in a /Table Query operation. The last output range you entered is displayed on the status line. If you wish to use it again, simply press **↵**. Otherwise, enter the cell range or cell block name and press **↵**.

The purpose of the Field Headings option is to allow you to load the headings for your output and criterion ranges in the Extract operation. Superplan first asks for the filename. Once you have entered it, the field headings from the dBase file are loaded into a partial row of the worksheet, with the first field heading in the current cell.

By moving the cell cursor to where you want the top-left hand cells of the criterion and output ranges, then loading the field headings, you can easily create the necessary headings for the Extract operation.

/UTILITIES

What it Does

- Displays the Superplan memory usage.
- Displays the names of all of the files on a disk.
- Specifies a common prefix for all filenames.
- Allows you to enter operating system commands without leaving Superplan.

How it Works

The prompt line displays the main options:

Status Directory Copy Rename Erase Prefix Help

Status

The **Status** option displays a table showing the extent of the spreadsheet, the right-most column and bottom-most row and the status of your computer's memory usage. Press any key to cancel the display.

Command Line Options

If you have loaded Superplan from the CLI (see the section headed **Start Options** earlier in this chapter), selecting the **Directory**, **Copy**, **Rename**, and **Erase** options open a CLI window on top of the workbench window. You may then enter the appropriate AmigaDOS command – **Dir**, **Copy**, **Rename** and **Delete**– to perform the operation required.

For example, to list the files in the current directory, you would enter:

dir

To rename the file "Test.spp" as "Newtest.spp", type:

rename Test.spp to Newtest.spp

You will find details of these and the other CLI commands in the documentation supplied with your machine. To close the CLI after executing a command, enter:

endcli

Note that these options are not available if you have loaded Superplan by double clicking on its icon.

File Prefix

The **Prefix** option changes the prompt line to:

FILE PREFIX: Enter file prefix

and displays the current file prefix on the status line. The file prefix is a string of characters that is automatically put at the beginning of any filename you create. This is particularly useful if you want all files to be put on the same drive, or have the same pathname, or start with the same string of characters.

To specify a prefix, type the required characters, then press **↵**. Superplan displays the new prefix on the status line and returns to the basic operations prompt. The prefix is stored by Superplan for future sessions.

To remove a file prefix, simply select the **Prefix** option, then press **↵**.

Examples

To ensure that every file you create is put on drive df1: in directory SPDATA, type:

DF1:SPDATA/ ↵

Rules

1. Note that if you copy to an existing file, all the information in that file will be lost. In other words, you should only overwrite a file when you no longer require the information in it.
2. In case you accidentally erase a file or lose or damage a disk, you should keep regular backup copies of all your disks.

/VIEW

What it Does

- Displays a graph in the Graph window
- Prints a graph on the printer.
- Copies the graph to a file on disk
- Draws a graph on the plotter.
- Selects a block of the worksheet to be graphed.
- Displays colour tables.
- Selects graphics devices and sets their options.
- Defines up to four graphics windows.

How it Works

The first prompt line displays the available options:

VIEW: Screen Print Draw Range Window Colour Options Help(F1)

If you select **Screen**, Superplan opens the Graph window on top of the worksheet window and displays the graph in the window. Initially, the window is one fifth the size of the screen. If you resize the window, by using the size gadget at the bottom right corner, the graph will be rescaled accordingly. When Superplan has displayed a complete graph on screen, clicking on the Close gadget at the top right of the Graph window or selecting Close from the Graph menu any key will remove the window from the screen and return control to the worksheet.

When you select **Print** or **Draw**, the graph defined in the worksheet is printed on the printer or drawn on the plotter respectively. To interrupt it at any time, press ESC. When Superplan has finished printing or drawing, it returns control to the worksheet.

Selecting a Graph Range

If you select **Range**, Superplan asks you to specify the cell range in which Superplan is to look for the graph instructions and data. This becomes the current graphics range and is displayed on the status line whenever you use /View. All other graph commands and data outside the current graphics range are ignored.

If no range is specified, Superplan looks at the entire worksheet. Specifying a graphics range allows you to select a subset of your data to be plotted or to select a set of graph commands from amongst many.

Graph Options

If you select **Options**, Superplan replaces the worksheet by the graph options. These allow you to define how your graph will be printed or plotted and on what particular machine. Use the arrow keys to highlight the graph option you require, then press the space bar to select a particular device or option.

There is also an option for copying the graph to disk. This stores the graph in a disk file as a list of instructions to the printer. At a later stage, you may then print the disk file, using the AmigaDOS command Copy from the CLI. If the printer is connected to the parallel port, you would enter:

copy "filename" par:

For printers which have a serial connection, enter:

copy "filename" ser:

As an alternative to storing the graph on disk as a printer file, you may also use the menu option Dump to store the file in the ILBM image format. Select Dump from the Graph menu and then enter a file name for the graph.

If you decide not to change any of the options, press ESC. If you do change any, press **↵**. Superplan asks you if you want to keep these settings for future Superplan sessions:

VIEW OPTIONS: Update parameter file? No Yes Help(F1)

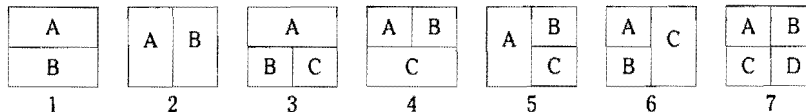
To keep these settings for future Superplan sessions, select **Yes**. To keep them only for this session, select **No**.

Colour Tables

To look at the colour tables for your screen, printer or plotter, select the main option **Colour**. Superplan replaces the worksheet by a table showing the current colour settings. These indicate which colours will be used when you enter different colour codes in your graph commands. The Request Colour option means that Superplan will prompt you for a plotter pen when you draw a graph on a plotter. To remove the colour tables from the screen and return to the worksheet, press any key.

Specifying Graph Windows

To display up to four graphs (A, B, C and D) simultaneously, select the **Window** option. You may select one of seven types of window layout:



Enter a number between 1 and 7 when prompted by Superplan, then the prompt line displays:

A B C D None Store Help(F1)

with the window type number displayed in the status line above.

If the window type you have selected does not include C and/or D, N/A is displayed above the letter, to show that you cannot specify a range for it.

Select a window (A, B, C or D), then enter a cell range or cell block name to identify the graph commands for this window. Do this for each of the windows in the type you have specified, then select the **Store** option to store these ranges. To clear all windows, select **None**.

For more information on the preparation of graphs, see Chapter 4 and the graphs example in Chapter 5.

/WINDOW

What it Does

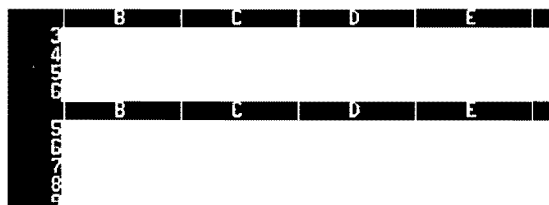
- Splits the screen horizontally into two windows.
- Splits the screen vertically into two windows.
- Synchronises cursor movement in the two windows.
- Un-synchronises cursor movement in the two windows.
- Returns the screen to a single window.
- Displays expressions on the worksheet.

How it Works

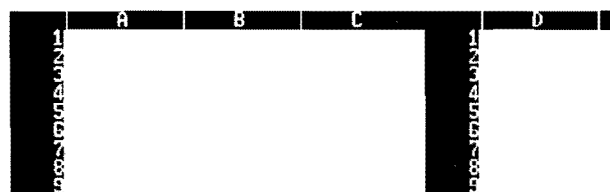
The prompt line displays the available options:

WINDOW: Horizontal Vertical None Sync Unsync Formula Help(F1)

If you select **Horizontal**, the screen immediately splits into two windows at the current row, with the current row in the upper window.



If you select **Vertical**, the screen immediately splits into two windows at the current column, with the current column in the left-hand window:



If you select **None**, the screen returns to a single window.

Two windows enable you to see two different parts of the worksheet at the same time. To move the cursor from one to the other, use the ; key. Note that you cannot have windows within a window.

Normally when you move the cursor, it only moves in the window in which it is placed; so only this window scrolls over the worksheet. The cursor still remains on screen and the row and column borders for this window change accordingly.

However, you may sometimes want the two windows synchronised, so that they scroll together, rather than independently. To do this, select the **Sync** option. You could then examine, say, the same columns of rows 1 to 10 and rows 201 to 210 without having to jump between the two windows to scroll the screen.

To remove synchronisation, select the **Unsync** option.

If you select the **Formula** option, the cell data on the screen in the current window is replaced by the cell expressions. Note that you may select this option without splitting the screen into windows, in which case the entire display is replaced by expressions. Alternatively you can use split windows to see the values and expressions of corresponding cells at the same time.

You can also print expressions when this option is set, by using the **/Output** command in the ordinary way.

To cancel the **Formula** option, simply enter **/WF** a second time.

Example

To create two windows of about equal size, split vertically, move the cursor to the column closest to the centre of the screen, and enter:

/VV

/XECUTE

What it Does

- Defines a right-hand boundary for the visible worksheet.
- Provides password protection for an area in the worksheet.
- Enters macro commands automatically.
- Executes autos and macros step by step.

How it Works

The /Xecute command is a useful aid for anyone who wants to use the Superplan programming facilities to develop their own applications. For more information on macros and programming, see Chapter 6.

Whether you are creating a simple macro or a complete user application, the /Xecute command helps you to enter, test and protect your work. The prompt line displays the main options:

XECUTE: Boundary Learn Single Step Help(F1)

To protect your programming work from unauthorised access, select **B**oundary. To enter a macro automatically, select **L**earn. To execute a macro (or auto) one step at a time, select **S**tep.

Defining a Boundary

In a typical application, you will want to separate the part that is of interest to the user from the inner workings of the application, the macros, menus, screens, and so on. To do this, put the latter on the right of the worksheet and use the **B**oundary option to limit the size of the worksheet that will be visible (and therefore available) to the user.

Before you can define (or remove or change) a boundary, Superplan asks you to enter a password. This may have as many as eight characters (Superplan ignores any character after the eighth), or you may press **_** if you do not want a password. The password is saved or loaded with the file whenever the file is saved or loaded. If a password has already been defined for the current worksheet and you enter the wrong password, Superplan displays:

INVALID PASSWORD

and exits from /Xecute. If you enter the correct password, Superplan displays the current boundary column (if there is one) on the status line and asks you to enter a new one. If you simply wish to remove the boundary, press **_**.

To specify a boundary, enter the alphabetic reference of the first column of the worksheet area you wish to protect. For example, if you enter:

ajo **_**

column AJO and the remaining 73 columns of the worksheet disappear from the screen and are no longer accessible to the user.

Incidentally, if you specify a boundary to the far left of the worksheet, you can protect an entire file from unauthorized access if necessary.

Note that you cannot create named ranges (see the /Name command earlier in this chapter) across or to the right of a boundary. Any existing named ranges across or to the right of a boundary are protected and cannot be deleted. If you attempt to delete such a range, Superplan displays an error message:

PROTECTED SYSTEM NAMED RANGE

You may only delete such ranges after you have moved or deleted the boundary.

Entering Macros Automatically

One way of entering a macro into the worksheet is simply to enter the data and macro commands into the appropriate cells just as if they were pieces of text. However, this means that you have to type in all the four-character codes for the non-alphanumeric keys, which takes time and increases the risk of mistakes.

You can minimize these problems by selecting the **Learn** option. Superplan first asks for the reference of the cell in which your first entry is to appear. From then on every key still performs its normal function, but it also automatically appears on the entry line in its macro command form. For example, if you press ↓ twice, the cursor moves down two cells and:

> MCD > MCD

is displayed on the entry line.

When you have finished the first line of the macro, press the **TAB** key. The contents of the entry line are moved to the first cell of the macro and you may now continue with the second line of the macro. Subsequent **TAB**s complete successive lines of the macro.

To exit from **Learn**, press the **TAB** key twice. Note that only those commands that correspond to specific keys on the keyboard can be entered automatically by **Learn**; commands that do not correspond to specific keys must be entered in full as text.

All of the commands described under /Auto earlier in this chapter are available within macros. However, there are a number of other commands which can also be used within macros; see Chapter 6 for details.

Executing Macros and Autos Step by Step

When you are writing and testing autos and macros, you frequently need to try them out to see if they work as they should. Often, however, Superplan performs the autos and macros too fast for you to see where any mistakes are.

In this case you can select the **Step** option. When you now execute a macro or auto, Superplan pauses before each command, so that you can see exactly where any error occurs. To perform the next command, press any key.

To cancel step by step operation, press the **ESC** key.

/ZAP

What it Does

- Blanks the entire worksheet.

How it Works

This command should be used with care, since all your data will be lost unless you have saved it on disk using the /Save command. Superplan asks you to confirm:

ZAP ALL CELLS: No Yes Help(F1)

If your current worksheet has been loaded from a file, Superplan also displays a reminder on the status line if you have changed the worksheet since it was loaded. To clear your worksheet of all data, select Yes. To cancel the command, select No.

Rules

1. The /Zap command clears the entire worksheet, including cells that are protected.
2. Make sure you save all your work before you use /Zap, as there is no way of retrieving it once it has been cleared from the worksheet.

CHAPTER 2. TIMESHEET

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INTRODUCTION

This chapter demonstrates how you can use the powerful time planning facilities of Superplan to turn part of your worksheet into a timesheet.

You can use a timesheet for a wide range of activities. For example, accountants can use it to find the most efficient way to cover audits and jobs with the available staff, builders can use it to plan a building project, production planners can work out how to make the best use of machine time with it, and so on.

This section shows you how easy it is to set up a timesheet and how once it is in action, you can instantly see the effect on your schedules if a machine breaks down, or a vital employee is ill. More importantly, it shows you how the Superplan timesheet will help you find the best solution to the problem.

To set up a timesheet you use time commands, which are similar to expressions and can make use of the full range of functions and operators described in Chapter 1. This section takes you through the necessary procedure step by step:

1. Estimating the space your timesheet will occupy and setting aside a suitable area of the worksheet for it.
2. Defining your working calendar: for this you must tell Superplan what units of time suit your schedule best (hours, days, weeks, etc), what days your company will not work (weekends, bank holidays, etc), and when you want your timesheet to start.
3. Defining the employees, machinery, etc, to be covered by the timesheet.
4. Allocating the jobs to the schedule; here you have a free hand to build in job dependencies (for example, Job B cannot start until Job A is finished, and Job C cannot start until both are finished). Superplan can cope with over 1000 separate, interdependent jobs.

Although you should try to make your timesheet as accurate as possible, Superplan does allow you to change any of the parameters at any time, so you can feel free to experiment as you learn how to use the commands.

ESTIMATING THE SIZE OF A TIMESHEET

If you look again at the House Improvement example provided with Superplan, you can see the format a timesheet takes. The calendar runs across the worksheet from left to right and the resources (people, machinery, etc) that you have at your disposal usually occupy a row each.

Although it is unlikely that a timesheet will occupy a large number of rows, it can easily spread over a large number of columns. So before you create a timesheet, it is a good idea to estimate its likely size, so that you can be sure it will not overrun other data in the worksheet.

A timesheet consists of a number of columns representing equal time units. You may choose from half-hours, hours, days, weeks, months, quarters, half-years and years.

Once you have selected the time unit, you must decide what period the timesheet is to cover. This will give you the approximate number of columns required. For example, if you select day units for a timesheet covering one month, you will need between 20 and 31 columns, depending on the number of non-working days. You can have as many as 1023 time units across the worksheet.

Since you will almost certainly want to label the rows of your timesheet, you should also add at least one more column for the labels.

To estimate the number of rows the timesheet is likely to occupy, count the number of resources you want to cover, then add however many rows you require for the date and time labels. You can use as many as 2048 rows altogether.

You should now have an idea of approximately how much space the timesheet is likely to occupy.

DEFINING THE CALENDAR

The calendar that you use with each timesheet is defined by the `/Calendar` command, details of which can be found in Chapter 1.

Calendar Options

Your first step should be to look at the calendar options (enter `/CO`):

Time units are

Working week is

Calendar start date is

Each time unit is represented by a column of your timesheet. For example, if you choose a time unit of weeks, then each column represents one week. Since jobs can only be defined as multiples of whole columns, you should choose the smallest time unit you are likely to be concerned with. For example, if one of your jobs lasts half a day, you should choose time units of hours rather than days.

Next you should decide which days of the week your timesheet is to cover. For example, if you choose a working week of Monday to Friday, then unless you specify to the contrary for particular weeks, all Saturdays and Sundays will be omitted automatically from your timesheet.

Finally you should decide when the calendar is to start. Superplan has a default start date of 1st January 1984. If you require a different start date, enter it in the form shown on the prompt line and press `↵`.

Calendar Edit

You should now look at the calendar itself (enter `/CE`). If your time units are days or larger, you need only look at each calendar month (enter `M`); however, if your time units are hours or half-hours you should also look at the default working day (enter `D`).

The monthly calendar will start at your specified start date and will already have taken into account the working week you specified under the calendar options, ie all non-working days will already be highlighted. It only remains for you to check all the months covered by your timesheet and specify any other non-working days.

The default working day shows which half-hours of the day are non-working and which are working.

To change the working hours of a particular day, select the `M` option to display the monthly calendar, then move the cursor to the day you want to examine. If you then press `M` again, the cursor jumps to the hours of the day. You can then edit them as you wish. When you press `↵` to return to the month, the day has the letter `M` displayed alongside it to indicate that this working day has been modified.

LINKING THE CALENDAR

To link the calendar to the timesheet, you need to define when the timesheet should start and in what column (enter /CL). All you need do is enter the start date in the form shown in the Superplan prompt and press **↵**.

Specify the column in which this start date should appear and press **↵**. Note, however, that this date will not appear until you have entered the appropriate calendar function in the worksheet (see next section).

The result of all this is to link each column of the worksheet to a particular time unit. For example, if you specify time units of days, a working week of Monday to Friday, a link start date of 1st June 1988, and a link column of C, then each column of the worksheet represents the following dates:

	C	D	E	F	G	H
1	1/ 6/88	2/ 6/88	3/ 6/88	5/ 6/88	7/ 6/88	8/ 6/88
2						

You are now in a position to construct your timesheet.

TIMESHEET COLUMNS

You can now set the width of your timesheet columns as you would with a spreadsheet, using the /Format command (see Chapter 1). The columns should be as narrow as possible, so that you can see as much of the timesheet on screen at a time, but for the sake of clarity they should be wide enough to show the full dates and times labelling the columns.

You have a wide choice of information with which to label the timesheet columns, such as hours and minutes, day, day and month, day, month and year, month and year, and so on. When you have decided what information to use as each column label, move the cursor to any cell on the row in which you want the labels of the timesheet to appear. Then enter the appropriate calendar function.

For example, if a daily calendar is linked to the timesheet in column C starting on 1st July 1985, and day, month and year labels are to be put along row 2, enter in, say, cell C2:

+ DOMOY(COL)_

(Note the use of the COL function. This simply returns the number of the current column. Its usefulness in this context will become clear in a moment.)
The result is:

	A	B	C	D	E	F
1						
2			1/ 6/88			

Note that the appearance of any date and time display is governed by the /Format command, in the same way as it controls the display of text and numeric values. To see the different formats that are available to you, cycle through the **Display format for dates and times** options under the /Format command (see Chapter 1).

To label subsequent columns of the worksheet, all you need do is replicate the expression along the row. For example, to replicate cell C2 into 23 columns, enter:

/R _
c2,d2:z2 _

The result is:

	A	B	C	D	E	F
1						
2			1/ 6/88	2/ 6/88	3/ 6/88	6/ 6/88

You may combine labels for your timesheet columns. For example, if you use /Calendar Options to change your time units to hours, you could enter in cell C1:

+ DOMOY(COL)_

and in cell C2:

+TOD(COL)_

If you then replicate cell C2 along row 2, the result is:

	A	B	C	D	E	F
1			1/6/88			
2			9.00	10.00	11.00	12.00
3						
4						

If you wish, you may replicate cell C1 into each column, or only into the columns representing the start of a new day, or into whichever columns you like.

TIMESHEET ROWS

The rows of a timesheet usually indicate the resources to be allocated to jobs in the timesheet. Down the left or right of the timesheet you should label the rows with the names of these resources.

Part of a typical timesheet may therefore look like this:

	A	B	C	D	E	F
1		4/7/88				
2		9.00	10.00	11.00	12.00	13.00
3						
4	Machine1					
5	Machine2					
6	Machine3					
7	Machine4					
8						

From row 4, each row represents the work to be done by each machine.

Note that in this example, the time units are hours. The DOMOY function has been used to display the date in cell B1, and the TOD function has been used to display the times along row 2.

JOBS

A job is a single activity to be performed by one or more of your resources, for example, an audit, a production run of brackets, or installing radiators. Superplan displays jobs in the following way:

	A	B	C	D	E	F
1		4/7/88				
2		9.00	10.00	11.00	12.00	13.00
Person1		← JOB1 →		← JOB2 →	← JOB4 →	
Person2		← JOB1 →			← JOB3 →	
Person3		← JOB1 →		← JOB5 →		

Each job is defined by a **time command**. You can enter the time command in any empty cell, but it is usually convenient to choose the first cell on the timesheet where the job is to appear. Once your cell cursor is in the right position, press the < key. Superplan prompts you with:

ENTER: This is a time command

You may then enter the command in the following format:

name,length,start,row

Note: the *start* and *row* are optional.

Name The job name may be either text enclosed by " characters, or a reference to a cell containing text. Upper case alphabetic characters are the same as lower case. For example, the following all name the same job:

"PREPARATION"

"Preparation"

C4, where cell C4 contains Preparation

The name of a job is displayed at the centre of the line indicating the job's length. The same name may appear in more than one job (eg the example above shows that Person1 is doing JOB1 for two hours and Person2 is doing JOB1 for three hours).

If a job is too short to display the job name in full, the name is truncated.

Length The job length is expressed as a number of columns, ie a number of time units. It may be any expression resulting in a numeric value. If the numeric value is not an integer, the length is the next highest integer if the decimal part is .5 or more, otherwise it is the existing integer part. For example:

A value of 4.5 gives a length of 5 columns

A value of 4.49 gives a length of 4 columns

The length of a job is indicated by a solid line covering the number of columns equivalent to the duration of the job. It starts with a left-arrowhead and ends with a right-arrowhead, and extends from the leftmost position in the start cell to the rightmost position in the end cell. If a job extends over a cell containing another job, the display of the first job may be truncated, as shown in row 6 above.

The length does not depend on the widths of the columns. For example, if the above columns are reduced by three characters, the worksheet looks like this:

	A	B	C	D	E	F
4	Person1	← JOB1 →	← JOB →	← JOB4 →		
5	Person2		← JOB1 →	← JOB →		
6	Person3			← JOB6 →		

Start

The start of a job is the cell in which the left-arrowhead is displayed. It is expressed as the number of the column in which the job is to start, where column A = 1, B = 2, and so on. It may be any expression resulting in a numeric value. If the numeric value is not an integer, the start column is the next highest integer if the decimal part is .5 or more, otherwise it is the existing integer part. For example:

A value of 4.5 gives a start column of 5 (E)

A value of 4.49 gives a start column of 4 (D)

Note that the NCOL function (see Chapter 1) can be used to return the number of a column for which you only know the alphabetic reference, for example:

NCOL("af") returns 32

Row

The row on which a job appears may define one of a number of different things about the job, but it usually indicates the resource to be allocated to the job. In the example above, each row is equivalent to a particular person, but in other cases rows may represent machines, materials, warehouse space, etc.

The row is expressed as the number of the row in which the job is to be placed. It may be any expression resulting in a numeric value. If the numeric value is not an integer, the row is the next highest integer if the decimal part is .5 or more, otherwise it is the existing integer part. For example:

A value of 4.5 gives a row of 5

A value of 4.49 gives a row of 4

In the example above, the command:

<"JOB1",2,2,4

names a job as JOB1, allocates it two time periods (hours in this case), starts it in column B and positions it on row 4.

The Display

The job is displayed on the specified row, with the start of the job in the specified start column and the line extending over the specified number of columns.

If you omit the row, the job is placed on the current row. If you omit the row and the start, the job starts at the current cell. If the length is zero, Superplan displays * in the current cell.

If the job overlaps a non-empty cell, the display is truncated. For example, if you enter:

<"JOB1",5,3,4,␣

in an empty cell anywhere in the following timesheet:

	A	B	C	D	E	F	
1							
2		4/7/88					
3		9.00	10.00	11.00	12.00	13.00	1
4	Person1	← JOB2 →					

the result is:

	A	B	C	D	E	F	
1							
2		4/7/88					
3		9.00	10.00	11.00	12.00	13.00	1
4	Person1	← JOB2 →					

(though cell C4 still contains the full length of JOB1).

If the job starts in a cell that is already part of an existing job, then the existing job is truncated. For example, if you enter:

<"JOB1",3,6,4,␣

into the same timesheet, the result is:

	C	D	E	F	G	H
1	10.00	11.00	12.00	13.00	14.00	15.00
			J		JOB1	

(though cell E4 still contains the full length of JOB2).

The Status Line

A time command is only contained in the cell in which the job starts. So the time command is only displayed on the status line if the current cell is the start of the job. For example, if you enter:

<"JOB1",3,5,4 ↵

into cell C1, the result is:

	C	D	E	F	G	H
1	10.00	11.00	12.00	13.00	14.00	15.00
			JOB1			

Cell E4 contains the time command, while cell C1 remains empty. (Note that although cells F4 and G4 appear to contain the job, they are in fact empty.)

Examples

Chapter 5 contains two detailed examples of the use of the Superplan timesheet. The PRINTER example contains a production schedule, while the AUDIT example contains a staff plan.

Rules

1. The total time command must not be more than 254 characters long. If you attempt to exceed 254 characters, Superplan ignores the extra characters.
2. The name, length, start and row must be separated by commas and must be typed in the correct order.
3. If you want to specify a row value, then you must not omit the start value, otherwise Superplan assumes that the row is the start.
4. If your command does not start with a < symbol, or is not a valid time command, Superplan displays an error message and treats your command as a piece of text.
5. If you attempt to position a time command in a non-empty cell by specifying a start or start and row already occupied, Superplan displays the message:

CAN'T START A TIME COMMAND IN NON-EMPTY CELL

JOB DEPENDENCIES

All the previous examples use text and numbers in the time commands. However, one of the most powerful features of Superplan is its ability to define jobs in terms of other information on the worksheet.

This information may come from a database part of the worksheet, a spreadsheet part of the worksheet, or even other parts of the timesheet. The important point is that this feature gives you the ability to schedule jobs and time realistically, and create and manipulate critical path information on a project schedule.

These dependencies can be built into any part of the time command.

Names

The most convenient way of entering job names into time commands is by creating a database of all the jobs, then accessing the names by cell reference. For example, the following is a simple job database:

	A	B	C	D	E	F	G	H	I
1									
2	Name	Weeks	Cost						
3	-----								
4	Job1	1.2	£176.00						
5	Job2	1.4	£255.00						
6	Job3	.8	£203.00						
7	Job4	1.0	£125.00						
8	Job5	1.5	£210.00						

The time command:

<a4,1_

takes Job1 from cell A4 and places it in the current cell, with a length of one column.

Lengths

Job lengths may be generated in a similar way. For example, if you are using time units of days and there are five working days in a week, you can automatically generate the correct length for Job1 from the above database:

<a4,5*b4_

This gives Job1 a length of six columns without you needing to enter it directly. If the current cell is E10, the result is:

	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
9															
10															
11															

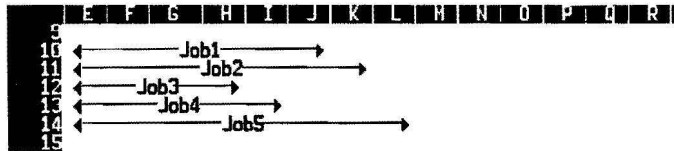
← Job1 →

Job Dependencies

All the Superplan functions are at your disposal, so you can make expressions defining job lengths as complex as you wish. However, it is often not necessary to enter every command individually. For example, to generate commands for each of the other four jobs, you could simply replicate the above command into cells E11 to E14:

/R _ e10,e11:e14 _

The result would be:



Starts

As with job lengths, job starts may be generated from expressions using data from anywhere in the worksheet and using any of the Superplan operators and functions.

AFTER is perhaps the most useful function that can be used with job starts. For example, if you want Job2 to start immediately after Job1, you can enter:

< a5,5*b5,AFTER(a4,10)_

In this example, you have specified that Job2 (the name of which is in cell A5) should start after the last occurrence of Job1 in row 10.

For a full explanation of the syntax of the AFTER function, see the appropriate section at the end of this chapter.

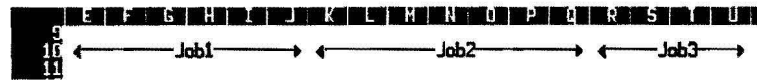
The AFTER function returns the number of the first free column after the completion of Job1, and this gives the start column for Job2:



You can now see one of the powerful features of Superplan by putting all the listed jobs one after the other on the same row. To do this, simply replicate the above time command orthogonally along the rest of the row by entering:

/ROk10,l10:n10_

The result is:



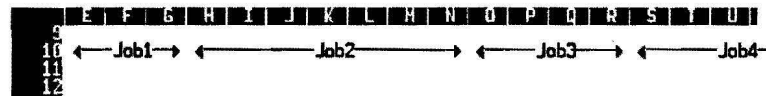
Cell R10 contains:

< a6,5*b6,AFTER(a5,10).┘

and cell V10 contains:

< a7,5*b7,AFTER(a6,10).┘

You can now perform 'what if' experiments on this timesheet and see the effect of changes in the database. For example, if you change the length of Job1 from 1.2 weeks to 0.6 weeks by changing the entry in cell B4, then recalculate the worksheet, the result is:



Superplan automatically recalculates the start columns for Job2, Job3 and Job4; their time commands are now contained in cells H10, O10 and S10 respectively.

You can use the **AFTER** function to specify a job start after a job on another row, and you can specify a start after any number of other jobs. To do this, just specify within the parentheses of the **AFTER** function the names or cell references of any occurrence of the jobs you want the present job to come after, separate the references by commas, and then put in the range of cells in which these jobs occur. The range is entered as for ranges on the spreadsheet, for example, a2:d6 is a valid range.

The **PRINTER** example described in Chapter 5 illustrates the use of time commands that refer to a job database to plan a schedule for a printshop.

Important Note: As with all other uses of the worksheet, care must be taken when defining dependent jobs that you choose the most appropriate order of recalculation. If you choose row-by-row recalculation, you should avoid using 'forward' cell references. If a time command contains a reference to a time command that comes after it in the order of recalculation, then the first command will be recalculated using the old value of the referenced command, rather than the new value.

If the referenced cell is in a row beneath the time command, but not in a column to the right of the command, you can make it a 'backward' reference by changing the appropriate /Global option from row-by-row calculation to column-by-column.

If forward cell references are unavoidable, then you should use natural order recalculation. In this case, however, you should make sure that you do not have any 'circular' cell references in your time commands. In particular, take care not to include a self-referencing command such as:

<"Job1",5,AFTER(ANY,ROW)

For more details on recalculation order, see the **Forward and Backward References** section and the /Global command in Chapter 1.

PROJECT SCHEDULING

Scheduling a project is a particular use of the Superplan timesheet and this section discusses the special considerations you should bear in mind.

A project consists of a number of jobs which need to be performed in a particular order. Some jobs will require resources, while others will consist only of elapsed time, such as the time between ordering and receiving essential materials.

As with all other timesheet applications, the first steps are to define the calendar and design the timesheet. These are done in exactly the same way as described at the beginning of this chapter. Remember that you can have as many as 1023 time units across the timesheet. If your project is likely to use more, then you should either use a larger time unit or divide your project into two.

For each job you must then define:

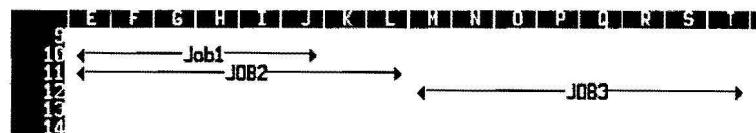
1. The resource it is to use, if any.
2. Its length.
3. Its dependence (if any) on any other job, ie whether it can start immediately, only on a particular date, or only on completion of another job or jobs.

The resource determines the row on which the job is displayed and the length determines how many columns it occupies. As with other timesheet applications, these can be defined by expressions using data from elsewhere in the worksheet.

Item 3 in the above list determines when the job can start. A job that can start either immediately or on a specific date can have its appropriate start column entered directly. A job that can only start when one or more other jobs are completed **must** have its start column defined by an AFTER function. This enables you to use the Superplan critical path facility.

The critical path establishes the shortest possible time in which a project may be completed and identifies all the jobs on which this shortest time depends.

For example, if a project consists of three jobs and Job3 cannot start until both Job1 and Job2 are completed:



the critical path is 16 time units long and consists of Job2 and Job3. If either of these jobs is extended, the overall length of the project also increases.

On the other hand, Job1 can be extended by two units before it begins to affect the start of Job3. If Job1 is extended by two or more time units, it will then become part of the critical path. The amount of time by which a job can be extended before it affects other jobs is known as its 'float', and this amount can be accessed by the FLOAT function (see later in this chapter).

For all projects in which the job starts are defined by AFTER functions, Superplan automatically calculates the critical path whenever you recalculate the worksheet. In order to set it up and display it on the screen, however, you need to issue one of the /Kritical commands (see Chapter 1).

The command /KP displays the critical path. Command /KF displays the critical path and any 'free floats'; a free float is the amount of time between the end of a job and the start of the next dependent job linked to it by an AFTER function.

Command /KT displays the critical path and the 'total floats'; the 'total floats' is the amount of time by which a job can be extended before it affects the completion date of the project.

On the display, the jobs with two solid lines form the critical path, the dotted lines represent float, and jobs with only a solid line are not yet critical. If you recalculate the worksheet while one of these commands is in force, Superplan not only recalculates the critical path, but amends the display as well.

Important Note: Superplan needs a reference point to calculate the critical path. To avoid errors you should ensure that the job which is to be completed last of all is on the bottom row of the timesheet and to the far right. If this is impractical, invent a job for the bottom row and specify that it has to be started after the last job is completed.

Note that you can also use the /Kritical Range command to specify a range in which the critical path is to be calculated.

A simple example of the use of critical path analysis is given in the LAUNCH example in Chapter 5.

TIME FUNCTIONS

The full range of functions and operators described in Chapter 1 are available to you when you are creating expressions related to your timesheet. However, the time functions are particularly relevant, so they are discussed in detail in the following pages.

Most of them examine one or more jobs (or ANY jobs) that lie on a specific row or within a specific range, and return different kinds of information about them. The following is a summary:

START	returns the column containing the earliest occurrence of the specified job(s).
END	returns the column containing the latest occurrence of the specified job(s).
LENGTH	returns the total length of the specified job(s).
AFTER	returns the column after the latest occurrence of the specified job(s).
FLOAT	returns the total length of 'float' for the specified job(s) (for critical path analysis only).
JNAME	returns the name of the job occupying the specified cell.

In combination with other functions, they can be used to calculate various figures, such as the start and end dates of a job, the cost of a job, the earliest start date of a dependent job, the amount of time by which you can allow a job to be delayed, and so on.

START

What it Does

- Returns the number of the column containing the earliest start of one or more specified jobs in a specified row or in a specified cell block.

How to enter it

START(jobnames,row/range)

jobnames The names of up to ten jobs, each expressed as text enclosed by " characters or as a cell reference, and separated by commas. ANY may be used instead of specific jobnames to indicate any job.

row The row expressed as a number or as an expression giving a row number.

range The cell block expressed as a range or name (see the /Name command in Chapter 1).

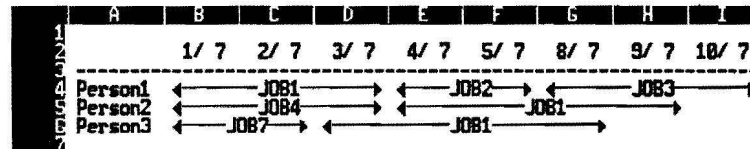
The result is the number of the column (where column A = 1, B = 2, and so on) containing the earliest (leftmost) start of all the specified jobs along the specified row or within the specified cell block.

If no relevant start cells are found, the function returns N/A (not available).

Examples

The expression:

+ START("JOB1",b5:f6)



returns the value 4 (column D). That is, in the week beginning 1st July, the first day in which Person1 or Person2 will be doing JOB1 is 3rd July.

The expression:

+ START(ANY,4)

returns the value 2 (column B). That is, the first start of any job for Person1 is on 1st July. The actual date could be obtained by a calendar function, for example:

+ DOM(START(ANY,4))

which returns the date 1/ 7.

Rules

1. There must be at least one job name (or ANY).
2. There must be either a row or a range, but not both.

END

What it does

- Returns the number of the column containing the latest end of one or more specified jobs in a specified row or in a specified cell block.

How to enter it

END(*jobnames,row/range*)

jobnames The names of up to ten jobs, each expressed as text enclosed by " characters or as a cell reference, separated by commas. ANY may be used instead of specific jobnames to indicate any job.

row The row expressed as a number or as an expression giving a row number.

range The cell block expressed as a range or name (see the /Name command in Chapter 1).

Superplan searches the specified row or block for occurrences of the specified job(s) and returns the number of the column (where column A = 1, B = 2, and so on) containing the latest (rightmost) job end.

If no relevant end cells are found, the function returns N/A (not available).

Examples

The expression:

+END(ANY,b4:f6)

	A	B	C	D	E	F	G	H	I
	1/ 7	2/ 7	3/ 7	4/ 7	5/ 7	8/ 7	9/ 7	10/ 7	
Person1		← JOB1 →		← JOB2 →		← JOB3 →			
Person2		← JOB4 →		← JOB1 →					
Person3		← JOB7 →		← JOB1 →					

returns the value 6 (column F). That is, of all the jobs being performed in the five days beginning 1st July, the latest to be completed will end on the 5th.

The expression:

+END("JOB2",b4:i4)

returns the value 6 (column F). That is, Person1 is due to complete JOB2 on 5th July. To return the actual date, you could use a calendar function, for example:

+DOMOY(END("JOB2",b4:i4))

which returns the date 5/ 7/85.

Rules

1. There must be at least one job name (or ANY).
2. There must be a row or range, but not both.

LENGTH

What it does

- Returns the total number of cells containing one or more specified jobs in a specified row or in a specified cell block.

How to enter it

LENGTH(*jobnames,row/range*)

<i>jobnames</i>	The names of up to ten jobs, each expressed as text enclosed by " characters, or as a cell reference, separated by commas. ANY may be used instead of specific jobnames to indicate any job.
<i>row</i>	The row expressed as a number or as an expression giving a row number.
<i>range</i>	The cell block expressed as a range or name (see the /Name command in Chapter 1).

Superplan returns the number of cells within the specified row or block containing the specified jobs. This can be used to find out how much total activity there is over a particular period, for example, or how much work has been allocated to a particular resource.

If the specified jobs do not occur anywhere in the specified row or block, the function returns 0.

Examples

The expression:

+ LENGTH(ANY,b4:f6)

	A	B	C	D	E	F	G	H	I	
1		1/ 7	2/ 7	3/ 7	4/ 7	5/ 7	8/ 7	9/ 7	10/ 7	
Person1		←	JOB1	→	←	JOB2	→	←	JOB3	→
Person2		←	JOB4	→	←	JOB1	→			
Person3		←	JOB7	→	←	JOB1	→			

returns the value 15, ie Person1, 2 and 3 are occupied for a total of 15 man-days during the five days beginning 1st July. If cell A8, say, contained the daily cost of performing each job, then the expression:

+ A8*LENGTH(ANY,b4:f6)

would return the total cost for that week. The expression:

+ A8*LENGTH(ANY,b4:b6)

would return the total cost for 1st July. This could then be replicated along a row to provide daily costs for every day in the timesheet.

The expression:

+ LENGTH("JOB1","JOB4",5)

returns the value 7, ie Person2 is devoting 7 man-days of effort to JOB1 and JOB4.

Rules

1. There must be at least one job name (or ANY).
2. There must be a row or range, but not both.

AFTER

What it does

- Returns the number of the column immediately after the column containing the latest end of one or more specified jobs in a specified row or in a specified cell block.
- Specifies job dependencies for critical path analysis.

How to enter it

AFTER(*jobnames,row/range*)

<i>jobnames</i>	The names of up to ten jobs, each expressed as text enclosed by " characters, or as a cell reference, separated by commas. ANY may be used instead of specific jobnames to indicate any job.
<i>row</i>	The row expressed as a number or as an expression giving a row number.
<i>range</i>	The cell block expressed as a range or name (see the /Name command in Chapter 1).

Superplan searches the specified block or row for occurrences of the specified job(s) and returns the number of the column (where column A = 1, B = 2, and so on) immediately after the column containing the latest (rightmost) job end.

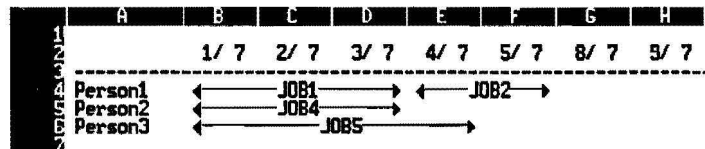
This function is useful when defining the start columns of jobs that depend on the completion of earlier jobs. It is essential when defining job dependencies in a project schedule. See the /Kritical command in Chapter 1 and the previous section in this chapter for more information.

If no relevant end cells are found, the function returns N/A.

Examples

The expression:

+AFTER(ANY,b4:h6)



returns the value 7 (column G). That is, of all the jobs being performed between 1st and 9th July, the first free date after the latest to be completed is the 8th. The actual date (8/ 7/85) can be obtained by the expression:

+DOMOY(AFTER(ANY,b4:h6))

The expression:

+AFTER("JOB4",5)

returns the value 5 (column E). That is, Person2 is due to be free for his next job on 4th July. His next job may therefore be defined by the following time command:

<"JOB6",6,AFTER("JOB4",5)

Rules

1. There must be at least one job name (or ANY).
2. There must be a row or range, but not both.
3. The start columns of dependent jobs in a critical path analysis must be defined by AFTER functions.

FLOAT

What it does

- Returns the total number of cells containing float for one or more specified jobs in a specified row or in a specified cell block (this is only applicable to Critical Path Analysis).

How to enter it

Float(*jobnames,row/range*)

jobnames The names of up to ten jobs, each expressed as text enclosed by " characters, or as a cell reference, separated by commas. ANY may be used instead of specific jobnames to indicate any job.

row The row expressed as a number or as an expression giving a row number.

range The cell block expressed as a range or name (see the /Name command in Chapter 1).

Superplan returns the number of cells in the specified row or block containing float for the specified jobs. If /Kritical Free Float is active, the function returns the free float; if /Kritical Total Float is active, it returns the total float.

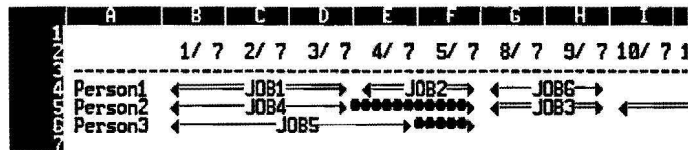
If there is no relevant float in the specified row or block, the function returns 0.

This function can be used to find out by how long one or more jobs can be extended before the start of the next dependent job in a critical path analysis is affected. See the /Kritical command in Chapter 1 and the **Project Scheduling** section of this chapter for more information.

Examples

The expression:

+ Float("JOB4",5)



returns the value 2, which is the number of days by which Person2 can be allowed to extend JOB4 before the start of JOB3 is delayed.

The expression:

+ FLOAT(ANY,b4:f6)

returns the value 3, ie there are three man-days of effort available in the five days starting 1st July, which can be used without delaying the start of JOB3.

Rules

1. There must be at least one job name (or ANY).
2. There must be a row or range, but not both.
3. The FLOAT function has a valid meaning only when the critical path is active.

JNAME

What it does

- Returns the name of the job occupying the specified cell.

How to enter it

JNAME(*cell*)

cell The reference (or name) of the cell.

Example

The expression:

+JNAME(d5)

	A	B	C	D	E	F	G	H	I
1									
2		1/ 7	2/ 7	3/ 7	4/ 7	5/ 7	8/ 7	9/ 7	10/ 7
3									
4	Person1	← JOB1 →		← JOB2 →		← JOB6 →			
5	Person2	← JOB4 →				← JOB3 →			
6	Person3	← JOB5 →							
7									

returns JOB4, ie the name of the job in cell D5.

NON-STANDARD TIMESHEETS

If you want to use time units other than half-hours, hours, days, weeks, months, quarters, half-years or years, then you can construct a timesheet using simple text labels and use the time functions in combination with a look-up table.

For example, to construct a timesheet using time units of quarter-hours, allocate one row to the column labels and enter the times as text:

	A	B	C	D	E	F
1	9.00	9.15	9.30	9.45	10.00	10.15

In the row above it (in this case, row 1) replicate the simple expression:

+COL

This gives you your lookup table, with the column numbers as the row to be looked up, and the times as the values to be returned.

You can now use this lookup table in combination with the time functions. For example, if JOB1 is as follows:

	A	B	C	D	E	F
1	9.00	9.15	9.30	9.45	10.00	10.15

← JOB1 →

you can obtain its start time from the expression:

+LOOKUP(START("JOB1",a3:f3),a1:f1)

The START function returns the value 2, because the job starts in column B. The LOOKUP function then looks for the value 2 along row 1 and returns the value in the cell immediately below:

9.15



CHAPTER 3. DATABASE

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INTRODUCTION

This chapter explains the concept of a database. It explains what a database comprises and how to set about creating one using the techniques and slash commands described in Chapter 1.

It shows you how to sort information within a database and how to select, identify and delete information according to specified criteria.

Finally there is an explanation of how to use the database functions.

There is a database example supplied with Superplan in the file COUNTRY.SPP. A brief description is given in Chapter 5.

WHAT IS A DATABASE?

A database is a way of storing similar kinds of information in a tabular form. You could have a database of all the people working in your company, all the different products you sell, names and addresses of all your customers, and so on.

A telephone directory is an example of a database. It consists of the same kinds of information (name, address and telephone number) for thousands of different people. Its main disadvantage, of course, is that in book form it is completely static.

The usefulness of a computerised database lies in its flexibility. If the telephone directory were computerised, you could rearrange it in the order of telephone numbers, or extract all the people who live in a particular town, or insert new telephone subscribers at will.

These are the sort of things you can do with your own information when you keep it in the form of a Superplan database.

A Superplan database is a cell block consisting of one or more columns and at least two rows. Each column is known as a **field**, and the first row of the database contains the field names. Each subsequent row is a **record**. For example, in the following worksheet:

	A	B	C	D	E	F
Inventory		Part No	Desc	Type	Colour	Price
		1000	Bracket	42	Black	1.42
		1001	Bracket	54	Grey	1.53
		1002	Support	92	Black	2.30
		1004	Joint	22	Grey	.56

cells B2 to F2 contain the field names, while rows 3 onwards contain the individual records. Note that each item of each record is stored in a single cell and that the same type of information is stored in the same field for each record.

CREATING A DATABASE

Because of the flexibility of the Superplan worksheet, there are few rules about how you should create a database. You may find it easier to work out on paper first what fields you require, how wide they should be, in what order and in what format. Or you may like to experiment directly on to the worksheet, finding out by trial and error what is the most convenient way of organising your data.

Considerations you should bear in mind are:

1. The field names must occupy the first row.
2. No two fields may have the same name.
3. Do not precede or follow a field name with a space character.
4. You may have up to 64 different fields.
5. You may enter up to 2047 records.
6. All the Superplan operators and functions are at your disposal for creating field entries.

You can use many of the Superplan slash commands to help you create and amend your database:

Inserting fields	Use the /Insert Column command.
Inserting records	Use the /Insert Row command.
Moving fields	Use the /Move Column command.
Moving records	Use the /Move Row command.
Changing field width	Use the /Format Column command.
Changing field format	Use the /Format Column command.

Check that the above commands do not affect other information in your worksheet.

Changing a field entry	Use the /Edit command.
Assigning a group of records the same value or expression in a certain field	Use the /Replicate command.
Keeping the field names on screen	Use the /Heading command.
Printing the database	Use the /Output command.

SORTING A DATABASE

A particularly useful thing to be able to do with your database is to sort all the records into a particular order. For example, you may want your product list in order of part number, in order of price, or in alphabetical order of name.

For this you use the /Table Arrange command (see Chapter 1).

A wise precaution before you use /Table Arrange is to create a new column alongside the database, containing sequential numbers. This will enable you to sort the records back into their current order if you wish. The best way to do this is to use the /Table Fill command to fill the new column with a sequence starting at 1 and increasing by steps of 1.

When you issue the /Table Arrange command, Superplan asks you to specify the block that is to be arranged. This block should contain all the fields of the database, otherwise some columns will be sorted, while others will not. It must not include the row containing the field names, otherwise they will be sorted with the records.

Next Superplan asks you to specify the key column. This is the column containing the field that determines the order of the records. You may either enter it in the form of the column letter, or point to it. For example, if you want your records sorted in order of surname, and the Surname field is in column D, you could enter:

D_

Finally, you must specify whether the sort is to be in ascending or descending order.

When Superplan performs the sort, any cell references within the rearranged block, affected by the rearrangement of the records, are automatically adjusted so that they still refer to the correct cells.

Sorting with More than One Key

If you want to sort records in order of two or more fields, start by /Table Arranging the least significant field, then the next most significant field, and so on to the most significant field.

For example, suppose you have a database of records including a name field, a street field and a town field. You want all the names in each street in alphabetical order, all the streets within each town in alphabetical order, and all the towns in alphabetical order. To do this, perform three /Table Arrange operations on the entire database in the following order:

1. Sort the records using the name field as the key column.
2. Sort the records using the street field as the key column.
3. Sort the records using the town field as the key column.

You can use this method for any number of key fields.

More details about /Table Arrange are given in Chapter 1.

DATABASE QUERIES

The /Table Query command (see Chapter 1) allows you to copy, identify or delete selected records from your database. Some examples of when you might use this command are:

- to select all product records with prices between £1.00 and £2.00.
- to delete all personnel records with leaving dates older than six months.
- to look at all customer records with outstanding balances greater than £300.00.

The /Table Query command provides five options:

Extract	Copies each selected record (or specified fields from each selected record) to another part of the worksheet.
Delete	Removes each selected record from the database, closing up the blank rows.
Find	Allows you to skip through the selected records.
Last find	Returns you to the last Find operation at the last found record.
Unique	The same as Extract, except that it does not copy the same record more than once.

But before you can use the command, you must prepare the **input** and **criterion** ranges and, in the case of the Extract and Unique options, the **output** range. In the following example worksheet, the input range is A2:E68, the criterion range is G2:H3, and the output range is A70:B90.

	A	B	C	D	E	F	G	H
1	Part No	Desc	Type	Colour	Price		Desc	Colour
2	1000	Bracket	42	Black	1.42		Bracket	Grey
3	1001	Bracket	54	Grey	1.53			
4	1002	Support	92	Black	2.30			
5	1004	Joint	22	Grey	0.55			
70	Part No	Price						
71								
72								

Input Range

This is simply the block containing the database (or the part of it you want searched). Note that this block must include the field names in its top row.

Criterion Range

This is the part of the worksheet that contains the names (which must be in the top row) of the fields you want Superplan to look at and the contents of those fields that you want the selected records to match. Note that the field names must be exactly the same as the corresponding names in the input range.

In the above example, the criteria in the criterion range indicate that Superplan must select all the records for Grey Brackets and no others. In other words, each field of the criterion range indicates what entries in that particular field Superplan is to look for. And if, as above, there are more than one criterion on a row, then each selected record must match all of them.

If a criterion cell is blank, Superplan will pick records with any entry in that field. For example, if instead of the above, the criterion range is G2:H4, and the criteria are:

	E	F	G	H	I
NAME			Desc Bracket	Colour Grey	

Superplan selects all Brackets and all parts coloured Grey. In other words, each selected record must match one row or the other, but it need not match both. If you include a completely blank row in the criterion range, Superplan simply selects all records.

If you prefer to think of this in terms of logical operators, criteria on the same row are connected by logical **and**, while criteria on separate rows are connected by logical **or**.

In the above example, exact criteria have been specified. However, criteria can be made more generalised. For example, if you wanted Superplan to select all colours beginning with 'Gr', you could enter:

	E	F	G	H	I
NAME			Desc	Colour Gr#	

This would match 'Green', 'Grey', 'Greasy', etc.

The # is a wildcard character, standing for any characters after the letters "Gr".

The ? character can be used to represent any single character. For example, 'f??' can be entered so that Superplan will select 'foot', 'feet', 'fact', and so on.

The ~ character can be used to invert a criterion. For example, '~ WT' will select all entries that are **not** WT.

These characters may also be combined in a criterion. For example, '~W??T#' will select all entries that do not have W as their first character and T as their fourth.

So far we have only described non-numeric criteria. Numeric criteria work in the same way, except that you can only specify exact matches. A number entered as a criterion instructs Superplan to select only those entries that have the same numeric value.

Finally, you can enter a criterion in the form of an expression, which is used as a test on each record of the input range. If a record satisfies the test, it is selected.

For example, you may want to select all records with a certain field value greater than 100, or all records in which the product of field A and field B is less than 50.

Write the expression as a test of the first record of the input range. Superplan automatically adjusts the cell references within the expression as it tests each record in turn.

For example, if you want to select all the products with prices greater than or equal to £2.00:

	A	B	C	D	E	F
1	Part No	Desc	Type	Colour	Price	
2	1000	Bracket	42	Black	1.42	
3	1001	Bracket	54	Grey	1.53	
4	1002	Support	92	Black	2.30	
5	1004	Joint	22	Grey	0.56	

enter a criterion in the form of the expression:

+e3 >= 2

You may also test the result of an expression involving a number of different fields. For example, to select all products with total sales exceeding £300.00, enter a criterion in the form:

+c3*e3 > 300

You may even use expressions that include references to other records in the database. In this case, however, you should take care over what happens with the records at the beginning and end of the database.

When specifying any expression as a criterion, it is essential that you take care over which cell references are relative and which absolute.

Use relative references where you want to operate on successive cells, but use absolute references if you want all tests to use a specific cell. For example, the criterion:

+e3 > G1

tests successive cells in column E to find values greater than the value of cell G1, when the /Global option **Adjust lower case cell references only** is set.

Output Range

This is only required for Extract and Unique operations and is the part of the worksheet where copies of the extracted records are to be put. The first row must contain the names of those fields you want copied and these names must be identical to the corresponding names in the input range.

You do not need to specify all the fields of the database, only those fields you want copied. You can therefore select not only the records to be copied, but also the fields to be copied.

The block must be large enough to contain all the records that are likely to be extracted, and it must either be empty or contain expendable data.

Using the /Table Query command

Once you have set up your input, criterion and output ranges, you are in a position to use the /Table Query command. First you must select Extract, Delete, Find, Last find or Unique. Then you enter the input range, the criterion range and, if necessary, the output range. They may be entered either as cell ranges or as cell block names. Note that if you wish to use the same ranges as in the last /Table Query operation (they are displayed on the status line), you need only press **_**.

If you specified Extract, copies of the specified fields of all the records that satisfy the selection criteria are placed in the output range. Note that this can result in a record being copied more than once, if it satisfies more than one row of the criterion range.

If you specified Delete, Superplan asks you to confirm the deletion of each record that satisfies the selection criteria. Remaining records move upwards to fill in the blank rows.

If you specified Find, Superplan highlights the first record that satisfies the selection criteria. The **↓** and **↑** keys then allow you to move to all the other selected records. The **←** and **→** keys allow you to move from field to field.

If you specified Last find, Superplan returns to the last Find operation at the position of the last found record. This is particularly useful if you are using Find to locate records that you need to amend.

If you specified Unique, Superplan copies the specified fields of all the records that satisfy the selection criteria, ensuring that no record is copied more than once.

LOADING RECORDS FROM A dBASE FILE

The /Table Load command (see Chapter 1) allows you to load records from a dBase file, according to specified criteria. It works in a very similar way to /Table Query Extract, the main difference being that you specify the dBase file instead of an input range.

So before you use this command, you must prepare a criterion range and an output range. To save you the trouble of having to remember the exact field headings of the dBase file, Superplan can load them directly from the file by using the /Table Load Field headings command.

Start by deciding where you want the records to appear on the worksheet (i.e. the output range) and move the cursor to the top left-hand cell of this area. Now enter the /Table Load Field headings command.

Logistix first ask for the filename. Once you have entered it, the field headings from the dBase file are loaded into the worksheet, with the first field headings in the current cell.

Of course, you do not have to use all of the field headings in the output range, or even have the output range in the same place. The only rule to remember is that the field headings must be on the first row of whatever range you specify.

To create the field headings for the criterion range, you can follow the same procedure.

When entering matching criteria for the criterion range, simply follow the same rules as for /Table Query. But when you define expressions as criteria, you must observe one important difference.

Under /Table Query, when you want a field of your database tested, you refer to it by a reference to the cell at the top of the relevant column of the input range. In /Table Load, however, there is no input range, so this method cannot be used.

Instead you simply point to the relevant field heading in the criterion range, just as you would if you were pointing to any cell to enter its reference in an expression. Superplan displays ERR in the criterion cell, but the expression is still there. For example, suppose your criterion range is G2:G3:

	A	B	C	D	E	F	G
1	Part No	Desc	Sales	Colour	Price		Sales

Loading Records from a dBase file

and you want to select all records that have Sales greater than 50. To enter the criterion, move the cursor to cell G3 and enter:

+

to start the expression. Then move the cursor to the word 'Sales' in cell G2 and enter:

508M_

You are now ready to use /Table Load Extract to load the selected records. Superplan first asks you for the dBase filename, then the criterion range, then finally the output range (A2 to, say, E30 in the above example). As with /Table Query, the last entries you specified for a /Table Load operation are displayed on the status line, so if you wish to use them again, you can simply press _.

Superplan copies the specified fields of all the records that satisfy the selection criteria from the disk file into the output range, until either it comes to the end of the disk file or the output range is full. In the example above, the result might be:

	A	B	C	D	E	F	G	I
STATUS	Part No	Desc	Type	Colour	Price		Sales	
	1000	Bracket	212	Black	1.42		ERR	
	1001	Bracket	103	Grey	1.53			
	1002	Support	433	Black	2.30			
	1004	Joint	52	Grey	0.56			

USING THE DATABASE FUNCTIONS

The database functions (see also Chapter 1) are designed to perform statistical calculations on values in records selected from a database according to certain criteria. The principle of selection is the same as for /Table Query Extract operations.

Each function requires an input range and a criterion range. These must be set up in exactly the same way as for /Table Query. The criterion range determines which records of the input range are to be used for the function.

The final argument is the field containing the values that are to be worked on. This may be entered as the field name or as the number of the column containing the field, offset from the first column of the input range. The first column of the input range has an offset of 0, the second column an offset of 1, the third column an offset of 2, and so on.

For each function, Superplan selects those records from the database that satisfy the criteria. Note that, as with /Table Query Extract, this may result in a record being selected more than once, if it satisfies more than one row of the criterion range.

Superplan then uses the values from those records that are in the specified field. For example:

	A	B	C	D	E	F	G
1	Part No	Desc	Type	Colour	Price		Sales
2	1000	Bracket	212	Black	1.42		ERR
3	1001	Bracket	103	Grey	1.53		
4	1002	Support	433	Black	2.30		
5	1004	Joint	52	Grey	0.56		

The expression:

+DMIN(a2:e6,g2:g3,2)

returns the value 212. That is, it looks through the input range (A2:E6) for all records whose colour is black (criterion range G2:G3), then returns the smallest Sales value (field offset 2) of all the selected records.

+DSUM(a2:e6,g2:g3,2)

returns 645, the sum of the Sales values in the two selected records.

+DCOUNT(a2:e6,g2:g3,2)

returns 2, the number of Sales values in the two selected records.

+ DAVG(a2:e6,g2:g3,2)

returns 322.5, the average of the Sales values in the two selected records.

+ DMAX(a2:e6,g2:g3,2)

returns 433, the maximum of the Sales values in the two selected records.

CHAPTER 4. GRAPHICS

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INTRODUCTION

Superplan can present the figures on your worksheet in the form of many different kinds of graph. The graph types at your disposal include pie charts, bar charts, Gantt charts, area graphs, line graphs, step graphs, tick graphs, scattergrams and spread graphs.

You can include titles, footnotes, legends and free format annotations. With axis-type graphs you have complete control over the axes names, divisions and labels.

There are a large number of character fonts and sizes, line styles and thicknesses and hatching styles to choose from. If you have a colour screen or output device you can produce your graphs in a mixture of different colours. Superplan also has a facility for producing free format text, which can be used to generate wordslides.

There are many other graphics features available; they are all described in this chapter. A number of example graphs are supplied with Superplan in the **GRAPHS.SPP** file; they are described briefly in Chapter 5.

The characteristics of a graph are defined by graph commands, which are entered in cells of the worksheet like other kinds of data. The next section of this chapter takes you through the process of creating a simple graph, so that you can see how some of these commands work.

This is followed by a section showing you how all the aspects of a graph can be controlled by the different commands. There are some simple rules for entering graph commands, followed by a summary of the commands available.

The bulk of the chapter consists of detailed descriptions of each graph command in alphabetical order.

CREATING A GRAPH

In this example, you want to produce a graph showing the sales breakdown in four sales areas. The figures are as follows:

	North	South	East	West
Product A	102	128	80	92
Product B	47	68	26	35
Product C	169	153	120	105

First select a free area of the worksheet, say:

	A	B	C	D	E	F
11						
12						
13						
14						
15						

Initially, the data is to be presented in the form of a vertical stacked bar chart (later on you will see how easy it is to change the graph type), so you could start by entering the appropriate bar chart command, BVS (which is short for Bar Vertical Stacked). This should be entered in the left-most column of your chosen area. So enter in, say, cell A12:

,BVS_

Note that it can be entered in upper or lower case. Note also that it must start with a comma, even though the comma is not displayed in the cell.

Next enter a command for each line of data. The data command for a bar chart is BAR, which must be in the same column as the BVS command. So enter in cell A13:

,BAR_

then in cell B13, the name of the data:

Product A_

Note that in this example it is entered as a piece of text. In practice it may be entered either as text or as a reference to a cell containing text.

The values must be entered in cells C13 to F13. In this case, enter them directly as numbers, although in practice you may enter values either as numbers or as expressions giving numeric values. The result is:

	A	B	C	D	E	F
11						
12	BVS					
13	BAR	Product A	102	128	80	92
14						

To enter the lines for each set of data, simply use successive BAR commands.
The result is:

	A	B	C	D	E	F
11						
12	BVS					
13	BAR	Product A	102	128	80	92
14	BAR	Product B	47	68	26	35
15	BAR	Product C	169	153	120	105
16						

Finally, you must label the bar stacks. The command for this is LBA, so enter in cell A16:

,LBA_

then the appropriate labels (as text) in cells C16 to F16:

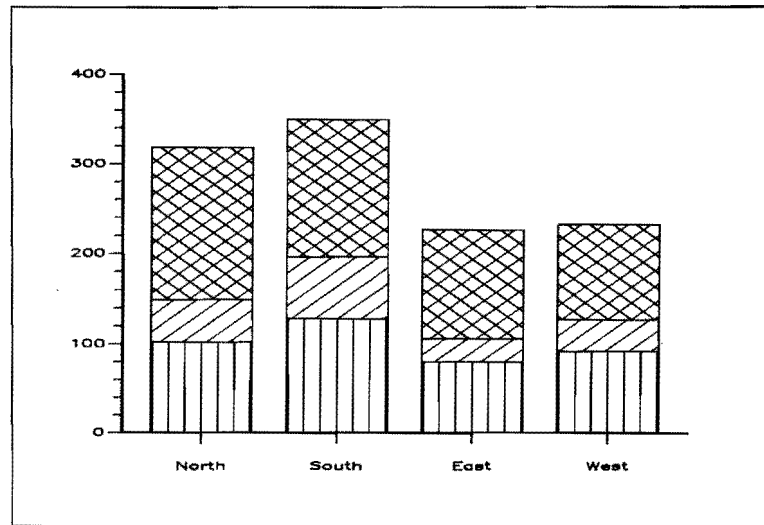
	A	B	C	D	E	F
11						
12	BVS					
13	BAR	Product A	102	128	80	92
14	BAR	Product B	47	68	26	35
15	BAR	Product C	169	153	120	105
16	LBA		North	South	East	West
17						

You are now in a position to see what you have created. To do this, simply press F4 VIEW or enter:

/VS

for /View Screen.

Your graph should look like this:



Note how Superplan automatically scales the Y (left-hand) axis to the values of your bars, and changes the hatching style for each set of values.

Of course, there are still some improvements to be made to it before it is complete, but it is already providing a good graphical representation of the data.

It should have a title. The main title command is TIA, so enter in, say, cell A11:

,TIA_

and in cell B11 the text for the title, say:

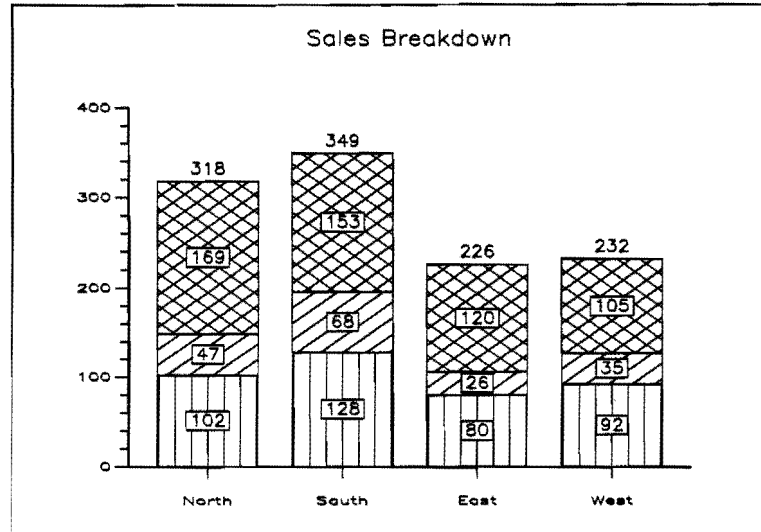
Sales Breakdown_

To display the values of each bar, you do not need an extra command. All you have to do is add a 'command modifier' to the BVS command. The appropriate command modifier is AN (which is short for annotate), so enter in cell A12:

,BVS AN_

Most graph commands have a large number of command modifiers that you can use to change the normal operation of the command. They can be used to control such things as character font and size, line style and thickness, colour, and so on. But on most occasions, you will probably find that the command chooses the best options without any modifiers.

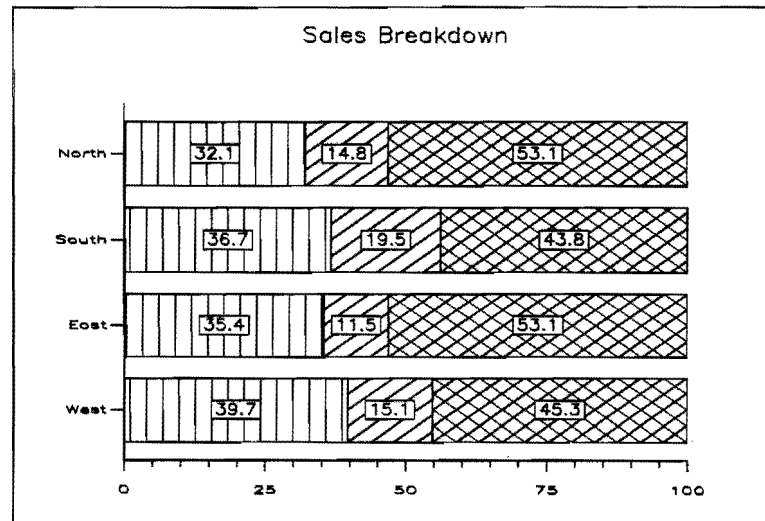
The graph now looks like this:



To see how easy it is to present exactly the same data in a different way, enter in cell A12 the command:

,BH% AN,1

This turns the vertical stacked bar chart into a horizontal percentage bar chart. This form of presentation is useful if the purpose is to show what percentage of the total sales in each area is from sales of each product.



Creating a Graph

You could also turn it into a vertical or horizontal clustered bar chart, a vertical percentage chart or a horizontal stacked bar chart. With very little amendment, you could also turn it into four pie charts.

To understand what each part of the stacks in your graph represent, you could also specify a legend (command LGD) and a position for it. You have a choice of nine different positions on the screen:

1	2	3
4	5	6
7	8	9

This position is specified by another command modifier, Pn, where n is any number between 1 and 9 (0 may also be used to define the position more precisely).

Finally, for neatness, you could also surround the legend by a box. This is specified by another command modifier, BX.

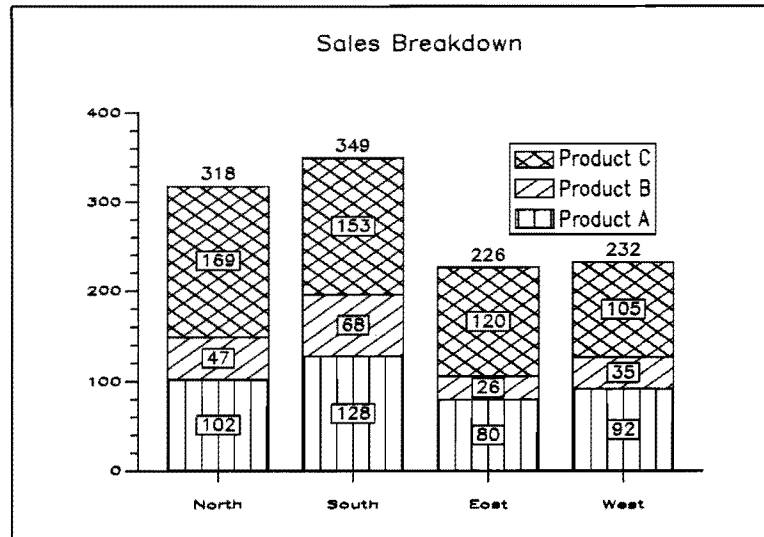
So the complete legend command could be:

,LGD P3 BX

which should be entered in cell A17. The full set of commands:

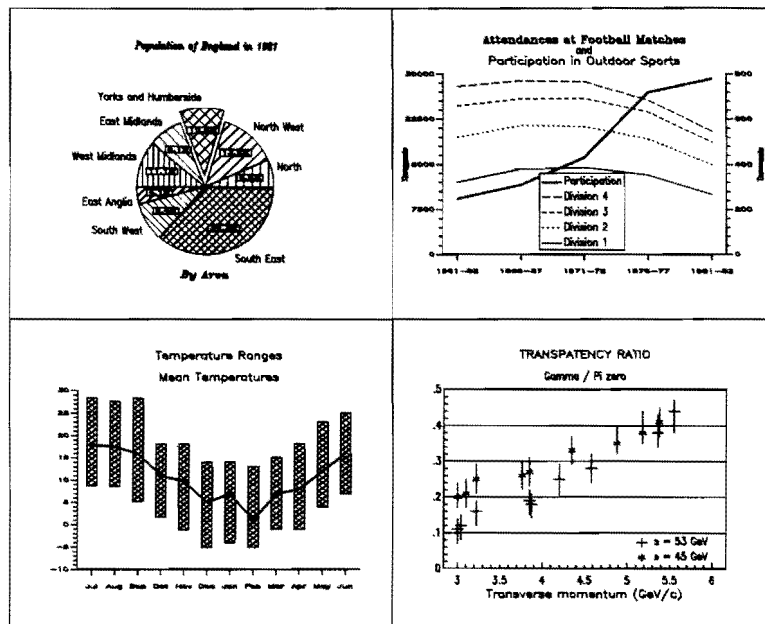
	A	B	C	D	E	F
11	TIA	Sales Breakdown				
12	BUS					
13	BAR	Product A	102	128	80	92
14	BAR	Product B	47	68	26	35
15	BAR	Product C	169	153	120	105
16	LBA	North	South	East	West	
17	LGD P3 BX					
18						

now produce a graph like this:



SOME MORE EXAMPLES

The graph commands used to generate the graphs shown below are described on the following pages. The graphs were created on a single page using the /View Windows command (see Chapter 1).



Individual Pie Chart

	A	B	C	D
1	Y1B F7	Population of England in 1981		
2	FNA S7 F7	By Area		
3	PIA			
4	PIE H1	North	3.1	
5	PIE H3	North West	6.5	
6	PIE EX H7	Yorks and Humberside	4.9	
7	PIE H5	East Midlands	3.8	
8	PIE H2	West Midlands	5.2	
9	PIE H4	East Anglia	1.9	
10	PIE H6	South West	4.4	
11	PIE H8	South East	17	
12				

This graph shows how the population of England in 1981 is distributed throughout different areas. It is designed as a simple pie chart with eight segments corresponding to the eight areas of the country.

The PIE commands define the different segments of the pie. Each one has been given an Hn modifier to specify a particular hatching style, although if they were omitted, Superplan would still automatically give each segment a different style. The EX modifier in the third PIE command tells Superplan to 'explode' this segment from the rest of the pie.

The TIB (secondary title) command includes the F7 modifier. This instructs Superplan to display the title in font 7. The FNA (main footnote) command also has the S7 modifier; this gives the footnote a larger character size than Superplan would have given it by default.

Combined Area Graphs and Line Graph

	A	B	C	D	E	F
1	YIA F2	Attendance at Football Matches				
2	TIB	and				
3	TIC S7	Participation in Outdoor Sports				
4	LBA		1961-62	1966-67	1971-72	
5	LIN YR T4 C1	Participation	248	318	432	
6	ARE C2	Division 1	12061	14243	14485	
7	ARE C3	Division 2	7453	7254	6769	
8	ARE C4	Division 3	5199	4421	4637	
9	ARE C5	Division 4	3267	2985	2749	
10	ULY	0	30000			
11	ULS	0	800			
12	NAY	Thousands				
13	NAS	Thousands				
14	LGD BX P8					
15						

This graph is designed to show how attendances at professional football matches have declined over the years between 1961 and 1982, while active participation in various kinds of outdoor sports has increased. (The figures for 1976-77 and 1981-82 are in columns F and G.)

It displays the football data as four area graphs (ARE commands) scaled to the left-hand Y axis. Each area graph is represented by a line, but each data point on the line is the sum of its own data value and those of the previous area graphs. Each area graph therefore represents an 'accumulation' of the previous area graphs. The effect is like a line graph version of a stacked bar chart.

The YR modifier in the LIN command instructs Superplan to scale the participation data line graph to the right-hand Y axis.

Some More Examples

As in the previous examples, nearly all of the commands use the default command modifiers. Superplan automatically displays the line graph and the first area graph in style L0, then changes the style for each subsequent area. Each has been given a specific colour by the Cn modifiers. The line graph has been given a thicker line by the T4 modifier.

The ULY and ULS commands set the upper and lower limits for the Y axis and secondary Y axis respectively. NAY and NAS label the Y and secondary Y axes with the vertical text 'Thousands'. LGD puts the graph legends in a box in position 8.

Combined Spread Graph and Line Graph

	A	B	C	D	E	F
TIA C2	Temperature Ranges					
TIC S7C3	Mean Temperatures					
LBA			Jul	Aug	Sep	Oct
SPV H8 C2			28.4	27.6	28.5	18.1
			8.7	8.6	5.3	1.7
LIN T4 C3			18	17.5	15.9	11
ACX	11	1	1			
ACY	40					

This graph is designed to show the ranges between the highest and lowest temperatures recorded during each of twelve consecutive months. It displays the data in the form of a floating bar spread graph. Note how the SPV command requires two lines: row 4 defines the high values and row 5 the low values.

Superimposed on it is a line graph joining the mean temperatures for the same twelve months. (The data for November to June is in columns G to N.)

To force Superplan to display the spreads as floating bars, the SPV command includes the hatching modifier H8. The axis command ACX gives the X axis 11 divisions, ie 12 ticks, with a label for each one. The ACY command gives the Y axis a total of 40 divisions, one for each degree centigrade.

Combined Spread Graph and Scatter Graph

This graph combines two spread graphs and two scatter graphs. It includes a number of interesting features.

To place the second title further below the first title, the TIC command is used instead of TIB. There is also a footnote in the default position at the bottom of the graph.

The two scatter graphs (SCT commands) use * and + as the scatter markers. The two vertical spread graphs (SPV commands) use continuous lines (style L0).

	A	B	C	D	E	F	G	H
1	TIA	TRANSPARENCY RATIO						
2	FNA S7	Transverse momentum (GeV/c)						
3	SCT R+ S8	s = 45 GeV	.21		.20	.25	.26	
4		Upper error	.04		.04	.04	.04	
5		Lower error	.03		.03	.03	.03	
6	SPV L0		.25		.24	.29	.30	
7			.17		.17	.21	.22	
8	SCT R+ S8	s = 53 GeV		.12	.11	.16		.18
9		Upper error		.03	.03	.03		.03
10		Lower error		.03	.03	.03		.03
11	SPV L0			.15	.14	.19		.21
12				.08	.07	.12		.14
13		X-Y		3.10	3.04	3.00	3.22	3.76 3.87
14	ULY		0.00	.50				
15	ACY TI S5		25.00					
16	ULX		3.00	6.00				
17	ACX TI S5		30.00	10.0				
18	GRY C1 Q0							
19	BOX							
20	LGD P9							

Rows 5, 6, 10 and 11 are not directly part of the graph data, but they are used to calculate the hi-lo values for the spread graphs. For example, the high value in cell C7 is the result of cell C4 plus C5, and the low value in cell C8 is the result of cell C4 minus C6. These expressions only needed to be entered once and then replicated along rows 7, 8, 12 and 13.

The X-Y command defines the X axis values at which the data points have been measured. The ULX command restricts the X axis to values between 3 and 6, while the ACX command splits it into 30 divisions, with larger ticks for every tenth division, ie for 3, 4, 5 and 6.

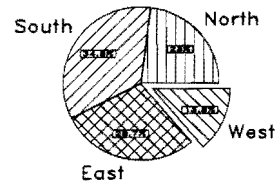
The ACY and ULY commands split the Y axis into 25 divisions, and restrict it to values between 0 and 0.5. The TI modifier in the ACX and ACY commands tell Superplan to display the axis ticks inside the graph instead of outside.

The GRY command puts horizontal grid lines across the graph and the BOX command 'boxes' the Y and secondary Y axes. Finally the LGD command is used to position the legends in the bottom right-hand corner, position 9.

TYPES OF GRAPH

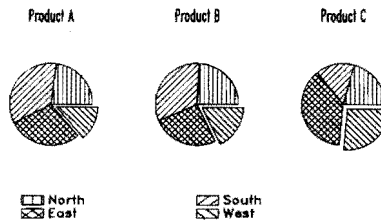
This section lists the different types of graph available. The appropriate graph commands are given in parentheses.

Individual Pie Chart



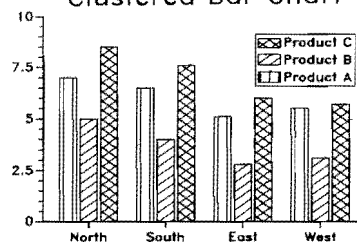
Individual pie charts (PIA/PIB/PIC/PID). The pie segments are defined by PIE commands.

Common Pie Charts

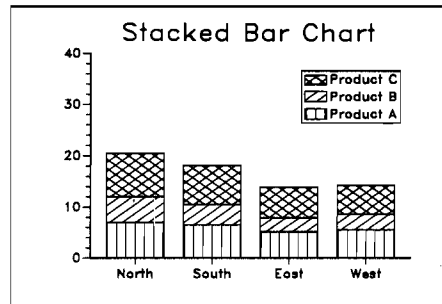


Common pie charts (PI2/PI3/PI4). The pie segments are defined by PIE commands.

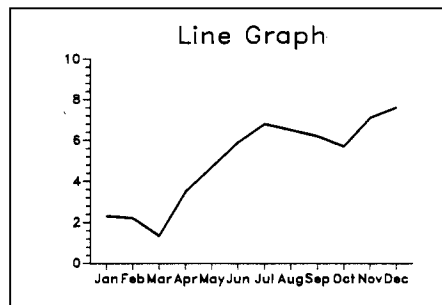
Clustered Bar Chart



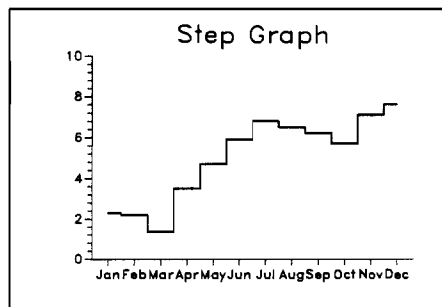
Clustered bar chart (BVC/BHC). The bars are defined by BAR commands.



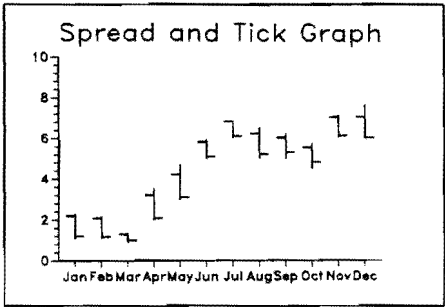
Stacked bar chart (BVS/BHS). The bars are defined by BAR commands. Percentage bar charts are defined by BV% / BH%.



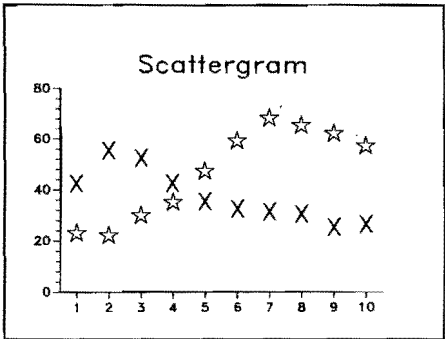
Line graph (LIN). An area graph (ARE) is like a line graph, except that each ARE command accumulates the values of the preceding ARE commands.



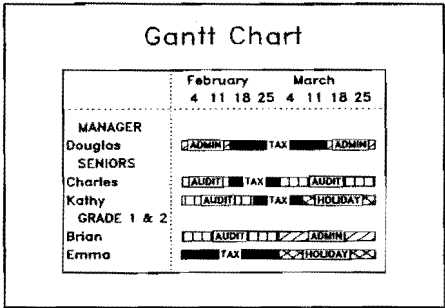
Step graph (STP).



Combined spread graph (SPV/SPH) and tick graph (TIL/TIR).



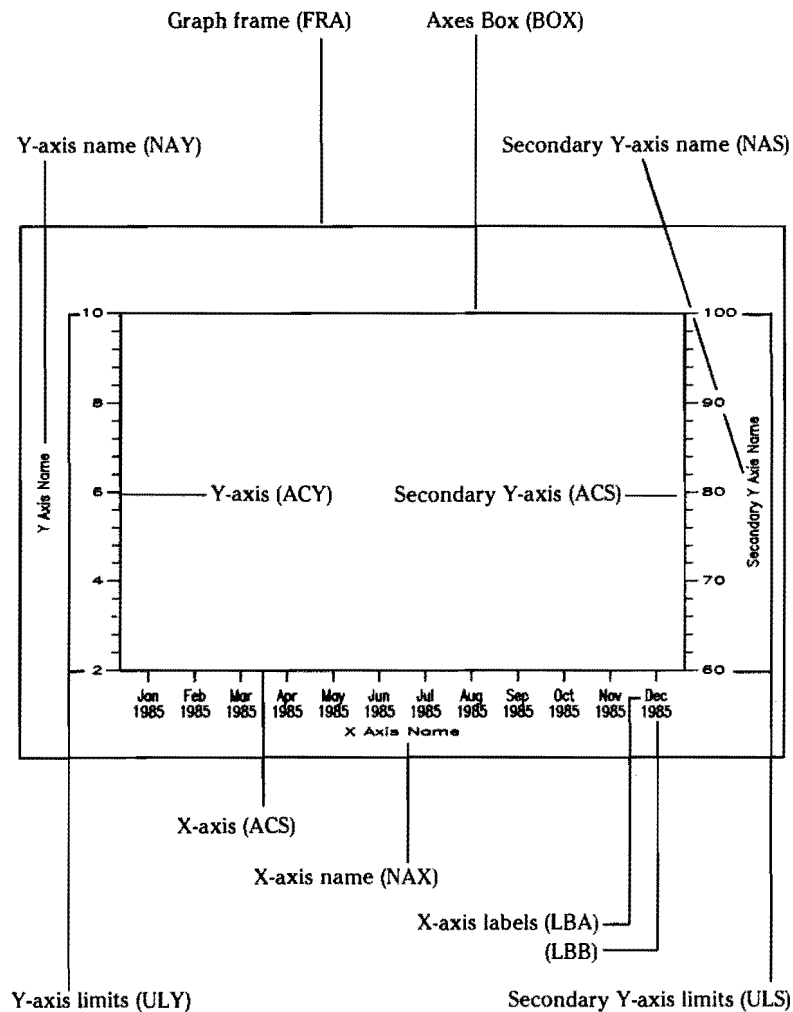
Scattergram (SCT).

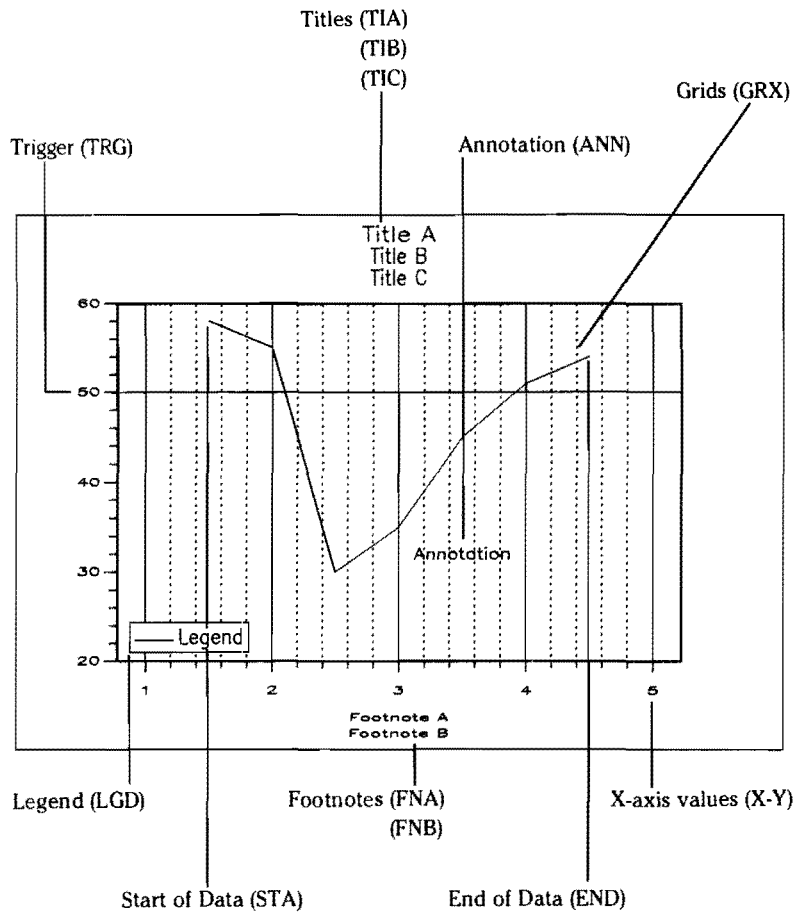


Gantt chart (GNT). Individual rows and jobs are defined by GAN and JOB commands.

THE PARTS OF A GRAPH

This section names the different parts of a graph and the Superplan commands that define them.





Tabs (TAB)

Tabs may be set at any position
between 1 and 100 across the screen.
Here, tabs have been set at 10, 20, 30.

This WRD command starts at the first tab.

This starts at the second tab.

This starts at the third tab.

Wordslides (WRD)

ENTERING GRAPH COMMANDS

As you have already seen, a graph command consists of a three-character code followed by a number of optional modifiers, for example:

PIA F3 S4 C2
Command modifiers

Each command occupies a cell and is displayed in the worksheet in much the same way as a piece of text (unless they are 'hidden'; see the /Global command in Chapter 1).

Some commands may also be followed by optional names or values. Details are given in the definitions of the individual commands later in this chapter.

To enter a graph command, you must first type a comma. The prompt line changes to:

ENTER: This is a graph command

You may then type your command. You should ensure that the cell used for each graph command is wide enough to accommodate the entire command, otherwise part of the command may not be visible.

If your command does not start with a comma, or is not a valid graph command, Superplan treats it as a piece of text.

You may type alphabetic characters in upper or lower case; Superplan assumes they are the same. For example, the following commands have exactly the same effect:

TIA f0
tia F0

The different elements of a command may be entered as an uninterrupted string of characters (though, for clarity, this is not recommended), or separated by spaces. For example, the following commands all have the same effect:

PIA S3 Q3
PIAS3Q3

The three-character command code must always precede the command modifiers, but the modifiers themselves may be typed in any order. For example, the following commands have the same effect:

ANN C2 JC S3 F2
ANN JC F2 C2 S3

A graph command may be entered anywhere on the spreadsheet, provided that the following cells on the same row contain the appropriate entries. For example, if you enter a PIA command in cell F4, then Superplan will look for the pie name in cell G4 and the ratio in cell H4.

In the following summary, the / character represents alternative entries, the [] characters represent optional entries, and the *n* character represents any number from 0 to 9.

Graph Type commands

Note: The overall characteristics of the pie chart(s) are defined by the PIA/PIB/PIC/PID or PI2/PI3/PI4 command, while the data values are defined by PIE commands.

Note: The overall characteristics of a bar chart are defined by the BVS/BVC/BV%/BHS/BHC/BH% command, while the data values are defined by BAR commands.

Axes Commands

Axes	1st cell: ACX/ACY/ACS [Fn] [Sn] [Cn] [Ln] [Tn] [Tn] [Qn] [TO/TL/TC] [IN/NI] [LG] 2nd cell: <i>[number of divisions]</i> 3rd cell: <i>[number of small divisions per large]</i> 4th cell: <i>[number of small divisions per label]</i>
Axes Names	1st cell: NAX/NAY/NAS [Fn] [Sn] [Cn] [Ln] [Tn] [Qn] [JL/JC/JR] 2nd cell: <i>axis name</i> 3rd cell: <i>[X co-ordinate]</i> 4th cell: <i>[Y co-ordinate]</i>
Axes Limits	1st cell: ULY/ULS/ULX 2nd cell: <i>upper limit</i> 3rd cell: <i>lower limit</i>
Axes Labels	1st cell: LBA/LBB 2nd cell: <i>blank</i> 3rd, 4th, 5th, . . cells: <i>labels</i>
X-axis Values	1st cell: X-Y 2nd cell: <i>blank</i> 3rd, 4th, 5th, . . cells: <i>X axis values</i>

Text Commands

Titles	1st cell: TIA/TIB/TIC [Fn] [Sn] [Cn] [Ln] [Tn] [Qn] [JL/JC/JR] 2nd cell: <i>title</i> 3rd cell: <i>[X co-ordinate]</i> 4th cell: <i>[Y co-ordinate]</i>
Footnotes	1st cell: FNA/FNB [Fn] [Sn] [Cn] [Ln] [Tn] [Qn] [JL/JC/JR] 2nd cell: <i>footnote</i> 3rd cell: <i>[X co-ordinate]</i> 4th cell: <i>[Y co-ordinate]</i>
Annotations (max 128)	1st cell: ANN [Fn] [Sn] [Cn] [Ln] [Tn] [Qn] [JL/JC/JR] 2nd cell: <i>annotation</i> 3rd cell: <i>X co-ordinate</i> 4th cell: <i>Y co-ordinate</i>
Wordslides (max 128)	1st cell: WRD [Fn] [Sn] [Cn] [Ln] [Tn] [Qn] [JL/JC/JR] 2nd or 3rd or 4th . . cell: <i>text</i>
Tabs	1st cell: TAB 2nd, 3rd, 4th, . . cells: <i>tab values</i>

Other Commands

Legend	1st cell: LGD [Fn] [Sn] [Cn] [JL/JC/JR] [Pn] [BX] [Ln] [Tn] [Qn] 2nd cell: [<i>X co-ordinate for P0</i>] 3rd cell: [<i>Y co-ordinate for P0</i>]
Grids	1st cell: GRX/GRY [Cn] [Ln] [Tn] [Qn] 2nd cell: [<i>number of minor divisions per major</i>]
Graph Frame	1st cell: FRA [Ln] [Tn] [Cn]
Axes Box	1st cell: BOX [Ln] [Tn] [Cn]
Start and End of Data	1st cell: STA/END
Trigger	1st cell: TRG [Ln] [Tn] [Cn] 2nd cell: <i>trigger value</i>
Set Font and Colour	1st cell: SET [Fn] [Cn]

Command Modifiers

Font	F0-8
Size	S0-9
Line	L0-9
Thickness	T0-9
Hatching	H0-9
Colour	C0-9, Q0-9
Marker	R0-9, R[<i>any character</i>]

DETAILS OF GRAPH COMMANDS

In the following pages, each graph command is described in detail. They are arranged in alphabetical order of their three-letter command code. The command modifiers are grouped together at the end of the chapter.

Each description starts with a brief summary of what it does. This is followed by the structure of the command. In this, the / character represents alternative entries, the [] characters represent optional entries, and the n character represents any number from 0 to 9.

The meaning of each option is then given. For details about the various command modifiers, see the relevant page at the end of this chapter.

This is followed by descriptions of what should be entered in the cells following the graph command.

ACX/ACY/ACS - AXES

What it Does

- Defines the X, Y and secondary Y axes for all axis-type graphs.
- Defines the colour, thickness and style of the axis.
- Defines the font, colour and size of the axis labels.
- Defines the number and characteristics of the axis ticks.
- Defines indentation of the graph from the axis.
- Defines logarithmic scaling.

How to Enter It

1st cell: ACX/ACY/ACS [*Fn*] [*Sn*] [*Cn*] [*JL/JC/JR*] [*Ln*] [*Tn*][*Qn*]
[*TO/TI/TC*] [*IN/NI*] [*LG*]
2nd cell: [*number of divisions*]
3rd cell: [*number of small divisions per large division*]
4th cell: [*number of small divisions per label*]

Three commands may be specified:

ACX for the X axis
ACY for the Y axis
ACS for the secondary Y axis

Options

Fn The font of the labels. The default is F0.

Sn The size of the labels. The default is S3.

Cn The colour of the labels. The default is C1.

JL/JR/JC This determines where the X axis labels are to be placed:
JL The first character is closest to the tick.
JR The last character is closest to the tick.
JC The middle character is closest to the tick
 (this is the default).

Ln The style of the line. The default is L0.

Tn The thickness of the line. The default is T3.

Qn The colour of the line and ticks. The default is C1.

TO/TI/TC There are three options:

TO Ticks are outside the graph area (this is the default)
TI Ticks are inside the graph area (the labels remain outside)
TC Ticks are across the axis line (the labels remain outside)

IN/NI If you enter IN, the graph is indented slightly from the other axis. If
 you enter NI, the graph is not indented. The default depends on the
 type of graph.

LG If you enter LG, the axis uses logarithmic scaling.

Note that while labels for the Y and secondary Y axes are displayed automatically, to specify labels for the X axis, you must use the LBA/LBB commands

2nd Cell

This is the number of divisions along the axis. It may be entered as an expression or number. For Y and secondary Y axes, the default is 20; Superplan automatically scales the axes so that the graph accommodates the values to be displayed. For the X axis, the default is the number of X axis data points less one.

3rd Cell

This is the number of small divisions per large division along the axis. It may be entered as an expression or number. The default is 5 for Y and secondary Y axes, and depends on the number of data values for the X axis.

4th Cell

This is the number of small divisions per label along the axis. It may be entered as an expression or number. The default is 5 for Y and secondary Y axes, and depends on the number of data values for the X axis.

ANN - ANNOTATION

What it Does

- Defines a piece of text to be displayed.
- Defines its font, size and colour, and underline thickness, style and colour.
- Defines its position and justification.

How to Enter It

1st cell: ANN [*Fn*] [*Sn*] [*Cn*] [*Ln*] [*Tn*] [*Qn*] [JL/JC/JR]
2nd cell: *annotation*
3rd cell: *X co-ordinate*
4th cell: *Y co-ordinate*

Options

Fn The font of the annotation. The default is F0.

Sn The size of the annotation. The default is S4.

Cn The colour of the annotation. The default is C1.

JL/JC/JR This determines where the annotation is to be placed:

JL The first character is on the X-Y co-ordinates (the default).

JC The middle character is on the X-Y co-ordinates.

JR The last character is on the X-Y co-ordinates.

If one of the following is specified, the annotation is underlined.

Ln The style of the underline. The default is L0.

Tn The thickness of the underline. The default is T1.

Qn The colour of the underline. The default is the colour of the annotation.

2nd Cell

This is the text of the annotation. It is displayed at the position defined by the J option and X-Y co-ordinates. It may be entered as text or as a cell reference.

3rd and 4th Cells

To define the position of the annotation, you must specify an X co-ordinate (3rd cell) and Y co-ordinate (4th cell). They may be entered as expressions or numbers. The X co-ordinate indicates a position from 0 to 100 across the display area from left to right. The Y co-ordinate indicates a position from 0 to 100 up the display area from bottom to top.

For example, an X co-ordinate of 50 and a Y co-ordinate of 75 gives a point roughly halfway across and three-quarters of the way up the display area. The default is X = 50, Y = 50.

Note: No more than 128 ANN commands may be used in one graph.

ARE - AREA GRAPH

What it Does

- Defines the name and values for an area graph.
- Defines the line style, colour and thickness.
- Scales the values to the left or right-hand Y axis.

How to Enter It

1st cell: ARE [*L_n*] [*T_n*] [*C_n*] [*YL/YR*]

2nd cell: [*area name*]

3rd, 4th, 5th, . . cells: *area values*

Options

L_n The style of the line. The default depends on the other ARE commands, if any.

T_n The thickness of the line. The default is T1.

C_n The colour of the line. The default depends on the other ARE commands, if any.

YL/YR There are two options:

YL Graph is scaled to the left-hand Y axis (the default)

YR Graph is scaled to the right-hand Y axis

2nd Cell

The area name is optional. It may be entered directly as text, or as a reference to a cell containing text.

3rd, 4th, 5th, . . Cells

These are the values used to calculate the points on the graph which define the area to be plotted. They may be entered as expressions or numbers. A single ARE command produces the same effect as a LIN command, but subsequent ARE commands 'accumulate' the data values. The effect is like a line graph version of a stacked bar chart.

BAR - BAR DATA

What it Does

- Defines the hatching style, colour and line thickness of a bar.
- Defines the colour of the surrounding box.
- Defines whether the bar is to be scaled to the left or right-hand Y axis.
- Defines the bar name and data values.

How to Enter It

1st cell: BAR [Hn] [Tn] [Cn] [Qn] [YL/YR]

2nd cell: [bar name]

3rd, 4th, 5th, . . cells: bar values

Options

Hn	The style of the bar hatching. The default depends on the other BAR commands, if any.				
Tn	The thickness of the hatching line. The default is T1.				
Cn	The colour of the bar hatching. The default depends on the other BAR commands, if any.				
Qn	The colour of the box surrounding the bar. The default is the colour specified for the bar hatching.				
YL/YR	This applies only to vertical clustered bar charts (BVC commands). There are two options: <table><tr><td>YL</td><td>Bar is scaled to the left-hand Y axis (this is the default).</td></tr><tr><td>YR</td><td>Bar is scaled to the right-hand Y axis.</td></tr></table>	YL	Bar is scaled to the left-hand Y axis (this is the default).	YR	Bar is scaled to the right-hand Y axis.
YL	Bar is scaled to the left-hand Y axis (this is the default).				
YR	Bar is scaled to the right-hand Y axis.				

2nd Cell

The bar name is optional. It may be entered directly as text, or as a cell reference.

3rd, 4th, 5th, . . Cells

These are the values used to calculate the sizes of the bars. They may be entered as expressions or numbers.

Notes

1. The BAR commands must be in the same column as the BHS/BHC/BH%/BVS/BVC/BV% command.
2. If there is no BHS/BHC/BH%/BVS/BVC/BV% command, the bar chart is assumed to be a vertical clustered bar chart.
3. No more than ten BAR commands may be specified for each graph.

BOX - AXES BOX

What it Does

- Defines the style, thickness and colour of the line(s) completing the box formed by the X, Y and, if defined, secondary Y axes.

How to Enter It

1st cell: BOX [*Ln*] [*Tn*] [*Cn*]

Options

Ln The style of the line. The default is L0.

Tn The thickness of the line. The default is T3.

Cn The colour of the line. The default is C1.

BVS/BVC/BV%/BHS/BHC/BH% - BAR CHARTS

What it Does

- Defines a vertical or horizontal bar chart.
- Defines stacked, clustered or percentage bars.
- Defines the colour, font and size of the bar value annotations.
- Defines the colour, thickness and style of the bar link lines.
- Defines three-dimensional bars.
- Defines the bar width and the amount of overlap in clusters.

How to Enter It

1st cell: **BVS/BVC/BV%/BHS/BHC/BH%** [AN] [Fn] [Sn] [Cn] [3D] [LB]
[Ln] [Tn] [Qn]
2nd cell: *[width of bar]*
3rd cell: *[overlap of cluster]*

There are six different types of bar chart:

BVS	Vertical stacked: bars are stacked vertically on top of each other, so that the height of a stacked bar is equivalent to the sum of its individual bar values.
BVC	Vertical clustered: bars are clustered vertically alongside each other.
BV%	Vertical percentage: bars are stacked vertically on top of each other, so that an individual bar is a percentage of its stacked bar. All the stacked bars are the same height, ie 100%.
BHS	Horizontal stacked: as BVS, but horizontal.
BHC	Horizontal clustered: as BVC, but horizontal.
BH%	Horizontal percentage: as BV%, but horizontal.

Options

AN	If you enter AN, the value of each bar is annotated. For stacked bars, the value of each bar is displayed within the bar and the total value of the stack (if there is more than one bar) is displayed at the end of the stack. For clustered bars, the value of each bar is displayed at its end. For percentage bars, the percentage value is displayed within each bar.
Fn	The font of the annotations. The default is F0.
Sn	The size of the annotations. The default is S4.
Cn	The colour of the annotations. The default is the colour of each bar (see the BAR command).
3D	If you enter 3D, bars are displayed in three dimensions.

LB	If you enter LB , the boundaries of adjacent bars are linked by lines. This is not applicable to clustered bar charts.
Ln	The style of the link lines. This only applies if LB is specified. The default is L0 .
Tn	The thickness of the link lines. This only applies if LB is specified. The default is T1 .
Qn	The colour of the link lines. This only applies if LB is specified. The default is the colour of the annotations.

2nd Cell

The width of the bar is expressed as a percentage of the distance between the edge of one bar and the same edge of the next. It should be entered as a number or expression giving a value between 0 (where each bar is displayed as a single line) and 100 (where adjacent bars touch). The default is 75.

3rd Cell

This only applies to **BVC** and **BHC** bar charts. It is the overlap of the cluster expressed as a percentage of the bar width, and it should be entered as a number or expression giving a value between -100 and +100. For example, a value of 100 specifies that adjacent bars are separated by the width of each bar; a value of 0 specifies that adjacent bars touch; a value of -50 specifies that adjacent bars overlap by 50%.

Notes

1. To define the individual bars, use **BAR** commands.
2. For horizontal bar charts the vertical axis is automatically positioned to allow sufficient room for the longest axis label.

FNA/FNB - FOOTNOTES

What it Does

- Defines a footnote for a graph.
- Defines its font, size, colour, underline thickness and style.
- Defines its position and justification.

How to Enter It

1st cell:	FNA/FNB [Fn] [Sn] [Cn] [Ln] [Tn] [Qn] [JL/JC/JR]
2nd cell:	footnote
3rd cell:	[X co-ordinate]
4th cell:	[Y co-ordinate]

Up to two footnotes may be defined for a graph: FNA and FNB.

Options

Fn	The font of the footnote. The default is F0.
Sn	The size of the footnote. The default is S3.
Cn	The colour of the footnote. The default is C1.
Ln	The style of any underline. The default is L0.
Tn	The thickness of any underline. The default is T1.
Qn	The colour of any underline. The default is the colour of the footnote.
JL/JC/JR	This determines where the footnote is to be placed: JL The first character is on the X-Y co-ordinates. JC The middle character is on the X-Y co-ordinates (default). JR The last character is on the X-Y co-ordinates.

2nd Cell

This is the text of the footnote. It is displayed at the position defined by the J option and the X-Y co-ordinates (or their default values).

3rd and 4th Cells

To change the position of the footnote, you may specify an X co-ordinate (3rd cell) and Y co-ordinate (4th cell). They may be entered as expressions or numbers. The X co-ordinate indicates a position from 0 to 100 across the display area from left to right. The Y co-ordinate indicates a position from 0 to 100 up the display area from bottom to top. For example, an X co-ordinate of 50 and a Y co-ordinate of 10 gives a point roughly halfway across and one-tenth of the way up the display area.

The defaults are: FNA X = 50, Y = 5
 FNB X = 50, Y = 2

FRA - GRAPH FRAME

What it Does

- Defines the style, thickness and colour of the frame surrounding a graph.

How to Enter It

1st cell: FRA [L_n] [T_n] [C_n]

Options

- L_n The style of the frame. The default is L0.
- T_n The thickness of the frame. The default is T1.
- C_n The colour of the frame. The default is C1.

GAN - GANTT ROW DATA

What it Does

- Defines the hatching style, colour and line thickness of a row of Gantt jobs.
- Defines the colour of the box surrounding each job.
- Defines the name of the row.
- Specifies the time commands that define the name, length and position of each job.

How to Enter It

1st cell: GAN [*Hn*] [*Tn*] [*Cn*] [*Qn*]

2nd cell: [*row name*]

3rd, 4th, 5th, . . . cells: *time commands*

Options

- | | |
|-----------|--|
| Hn | The hatching style of each job along the row. The default depends on the other GAN commands, if any. |
| Tn | The thickness of the hatching line. The default is T1. |
| Cn | The colour of each job along the row. The default depends on the other GAN commands, if any. |
| Qn | The colour of the box surrounding each job. The default is the colour specified for the hatching. |

2nd Cell

The row name is optional. It may be entered directly as text, or as a cell reference. It is displayed in the border alongside the row of jobs. its font, colour and size are defined by the LGD command.

3rd, 4th, 5th, . . . Cells

These contain the time commands that define the name, length and position of each job along the row. They must be entered directly as time commands, not simply as references to cells containing time commands.

1. If you enter a number of GAN commands, the row border is automatically adjusted to accommodate the longest row name specified.
2. You may enter up to 128 different GAN commands for one Gantt chart.
3. Jobs are normally displayed as bars. However, if you have a critical path active (see the /Kritical command in Chapter 1), they are displayed as single lines if they are not on the critical path and as double lines if they are. Floats are indicated but single dotted lines.

4. The command modifiers in a GAN command which specify the characteristics of the jobs along a particular row can be overridden by JOB commands (see later in this chapter). These allow you to specify the same characteristics for a particular job wherever it appears.
5. The characteristics of the row name are controlled by the LGD command.

GNT - GANTT CHART COMMAND

What it Does

- Defines a Gantt chart for displaying jobs.
- Defines the colour, font and size of job annotations.
- Defines the colour and thickness of the box surrounding the chart.
- Defines the line style of the row and column border dividers.
- Expands the chart to fill the whole page.

How To Enter it.

1st cell: GNT [AN] [Fn] [Sn] [Cn] [Ln] [Tn] [Qn] [EX]

Options

- AN** If you enter AN, the name of each job is displayed inside its bar.
- Fn** The font of the job names. The default is F0.
- Sn** The size of the job names. The default is S3.
- Cn** The colour of the job names. The default is the colour of each job (see the GAN and JOB commands).
- Ln** The style of the lines that separate the row and column borders from the main part of the chart. The default is L1.
- Tn** The thickness of the surrounding box. The default is T1.
- Qn** The colour of the box surrounding the Gantt chart. The default is C1.
- EX** Prevents a border being drawn around the chart, and expands the chart to fill the whole screen or page, apart from the title area.

GRX/GRY - GRIDS

What it Does

- Defines grid lines for the X and Y axes.
- Defines the grid line style and colour.
- Defines the major grid line colour and thickness.
- Defines the number of minor lines for each major grid line.

How to Enter It

1st cell: GRX/GRY [Cn] [Ln] [Tn] [Qn]

2nd cell: *[number of minor division per major division]*

There are two commands:

GRX for the X axis

GRY for the Y axis (scaled only to the Y axis, not to the secondary Y axis)

Options

Cn The colour of the major grid lines. The default is C1.

Ln The style of the minor grid lines. The default is L0.

Tn The thickness of the major grid lines. The default is T1. Note, by default the major grid line style is L0; however, if T0 is specified here, the major grid lines adopt the style of the minor grid lines.

Qn The colour of the major grid lines. The default is the colour of the major grid lines.

2nd Cell

The number of minor divisions per major division is optional. It may be entered as an expression or number. The default is 5.

JOB - JOBS

What it Does

- Defines the colour and style of a job, wherever it appears on the Gantt chart.
- Defines the font, size and colour of the job name.
- Defines the colour of the box surrounding the job.

How to Enter It

1st cell: JOB [*Fn*] [*Sn*] [*Cn*] [*Hn*] [*Tn*] [*Qn*]

2nd cell: *cell name*

Options

- Fn* The font of the job name. The default is F0.
- Sn* The size of the job name. The default is S4.
- Cn* The colour of the job and the job name. The default depends on the other JOB commands, if any.
- Hn* The hatching style of the bar (if /Kritical is active the job is displayed as it appears on the timesheet). The default depends on the other JOB commands, if any.
- Tn* The thickness of the line. The default is T1.
- Qn* The colour of the box surrounding the bar. The default is the colour of the bar hatching.

2nd Cell

This contains the text of the job name. This cell must be referred to by the time commands in your timesheet in order for the graph attributes to be assigned to job in the Gantt chart.

Notes

1. You may enter up to 128 different JOB commands for one Gantt chart.
2. Jobs are normally displayed as bars. However, if you have a critical path active (see the /Kritical command in Chapter 1), they are displayed as single lines if they are not on the critical path and as double lines if they are. Float are indicated by single dotted lines.
3. The command modifiers in a JOB command which specify the characteristics of the job override those in the GAN command (see earlier in this chapter).

LBA/LBB - AXES LABELS

What it Does

- Defines the labels for the axis ticks.

How to Enter It

1st cell: LBA/LBB

2nd cell: *blank*

3rd, 4th, 5th, . . cells: *labels*

The LBA command defines the first line of labels. The LBB command defines the second line.

3rd, 4th, 5th, . . cells

These contain the text of the axis labels. They may be entered as text, or as references to cells containing text. Each label should be entered in the column containing the value(s) for that data point.

LGD - LEGEND

What it Does

- Defines the legends for a graph.
- Defines the position of the legends on the graph.
- Defines the font, colour and size of the legend text.
- Defines the justification of the legend text.

How to Enter It

1st cell: LGD [Fn] [Sn] [Cn] [JL/JC/JR] [Pn] [BX] [Ln] [Tn] [Qn]

2nd cell: [X co-ordinate for P0]

3rd cell: [Y co-ordinate for P0]

Options

Fn The font of the legends. The default is F0.

Sn The size of the legends. The default is S4.

Cn The colour of the legends. The default is the colour of the data set.

JL/JC/JR This determines how the legend and text are to be aligned (applicable to axes-type graphs only):

JL Legend and text aligned down the left (this is the default).

JC Legend aligned down the left and text down the right.

JR Legend and text aligned down the right.

The text for the different legends is taken from the 2nd cell following the graph data commands (for example, BAR, LIN or STP).

Pn (applicable to axes-type graphs only) There are nine fixed positions on the graph for the legend, P1 to P9:

1	2	3
4	5	6
7	8	9

In addition, if you enter P0, you can define the position of the legend by specifying in the 2nd and 3rd cells the X-Y co-ordinates of its bottom left-hand corner.

BX	If you specify BX, the legend is surrounded by a box.
L_n	The line style of the box. The default is L0.
T_n	The line thickness of the box. The default is T1.
Q_n	The line colour of the box. The default is C1.

2nd and 3rd Cells

If you specify a position of P0, you can define the position of the bottom left-hand corner of the legend area (ie the position at which the legend for the first data set will appear), by entering an X co-ordinate (2nd cell) and Y co-ordinate (3rd cell). They may be entered as expressions or numbers.

The X co-ordinate indicates a position from 0 to 100 across the display area from left to right. The Y co-ordinate indicates a position from 0 to 100 up the display area from bottom to top. For example, an X co-ordinate of 50 and a Y co-ordinate of 75 gives a point roughly halfway across and three-quarters of the way up the display area.

Notes

1. For individual pie charts (PIA/PIB/PIC/PID command) the legend text automatically appears alongside the appropriate segment. The LGD command can be used to define the font, size and colour of the legend text.
2. For common pie charts (PI2/PI3/PI4 command) the legends automatically appear along the bottom of the graph area. The LGD command can be used to define the font, size, colour and justification of the legend text.
3. For Gantt charts, the LGD command can be used to define the characteristics of the row name (see the GAN command).

LIN/STP/TIL/TIR LINE, STEP AND TICK GRAPH

What it Does

- Defines the name and values for a line, step, tick left or tick right graph.
- Defines the line, step or tick colour, thickness and style.
- Scales the values to the left or right-hand Y axis.

How to Enter It

1st cell: LIN/STP/TIL/TIR [*L_n*] [*T_n*] [*C_n*] [*YL/YR*]

2nd cell: [*line name*]

3rd, 4th, 5th, . . cells: *graph values*

Four types of graph are available:

LIN	Line graph: data points are joined by straight lines.
STP	Step graph: data points are joined by horizontal and vertical steps.
TIL	Tick left graph: each point is indicated by a short horizontal line to the left.
TIR	Tick right graph: each point is indicated by a short horizontal line to the right.

Options

<i>L_n</i>	The style of the line, step or tick. The default depends on the other LIN/STP/TIL/TIR commands, if any.				
<i>T_n</i>	The thickness of the line, step or tick. The default is T1.				
<i>C_n</i>	The colour of the line, step or tick. The default depends on the other LIN/STP/TIL/TIR commands, if any.				
YL/YR	There are two options: <table><tr><td>YL</td><td>Graph is scaled to the left-hand Y axis (this is the default)</td></tr><tr><td>YR</td><td>Graph is scaled to the right-hand Y axis</td></tr></table>	YL	Graph is scaled to the left-hand Y axis (this is the default)	YR	Graph is scaled to the right-hand Y axis
YL	Graph is scaled to the left-hand Y axis (this is the default)				
YR	Graph is scaled to the right-hand Y axis				

2nd Cell

The name is optional. It may be entered directly as text, or as a reference to a cell containing text.

3rd, 4th, 5th, . . Cells

These are the values used to calculate the points on the graph. They may be entered as expressions or numbers.

Notes

1. No more than ten line, step or tick graphs may be used on one graph.

NAX/NAY/NAS - AXES NAMES

What it Does

- Defines names for X, Y and secondary Y axes.
- Defines a name's colour, font and size.
- Defines a name's underline style, thickness and colour.
- Defines a name's position.

How to Enter It

1st cell: NAX/NAY/NAS [*F_n*] [*S_n*] [*C_n*] [*L_n*] [*T_n*] [*Q_n*] [JL/JC/JR]
2nd cell: axis name
3rd cell: [*X co-ordinate*]
4th cell: [*Y co-ordinate*]

Options

F_n The font of the axis name. The default is F0.
S_n The size of the axis name. The default is S3.
C_n The colour of the axis name. The default is C1.
L_n The style of any underline. The default is L0.
T_n The thickness of any underline. The default is T1.
Q_n The colour of any underline. The default is the colour of the axis name.
JL/JC/JR This determines where the axis name is to be placed:
JL The first character is on the X-Y co-ordinates.
JC The middle character is on the X-Y co-ordinates (default).
JR The last character is on the X-Y co-ordinates.

2nd Cell

This is the text of the axis name. It may be entered directly as text, or as a cell reference. It is displayed at the position defined by the J option and the X-Y co-ordinates. A name for a vertical axis is rotated so that it is parallel to the axis.

3rd and 4th Cells

To define the position of the axis name, you may specify an X co-ordinate (3rd cell) and Y co-ordinate (4th cell). They may be entered as expressions or numbers. The X co-ordinate indicates a position from 0 to 100 across the display area from left to right. The Y co-ordinate indicates a position from 0 to 100 up the display area from bottom to top. For example, an X co-ordinate of 5 and a Y co-ordinate of 50 gives a point close to the left-hand edge and halfway up the display area.

If you do not specify X and Y co-ordinates, the axis name is automatically positioned at the centre of the axis outside the graph area.

PIA/PIB/PIC/PID - INDIVIDUAL PIE CHARTS

What it Does

- Defines single or multiple pie charts.
- Defines the pie name and the name's font, size and colour.
- Defines the colour of the pie segment borders.
- Defines the size of the pie relative to other pie charts.

How to Enter It

1st cell: PIA/PIB/PIC/PID [*Fn*] [*Sn*] [*Cn*] [*Qn*] [*AS*]

2nd cell: [*pie name*]

3rd cell: [*ratio*]

Up to four individual pie charts may be displayed in various positions in the display area:

- PIA** This is positioned in the centre of the display area.
- PIB** This is positioned in the right-hand half of the display area. The PIA pie chart (if there is one) is positioned in the left-hand half. If the graph is rotated, PIA is positioned above PIB.
- PIC** This is positioned in the right-hand third of the display area. The PIA and PIB pie charts (if there are any) are positioned in the left-hand and centre thirds respectively. If the graph is rotated, PIA, PIB and PIC are placed above one another.
- PID** This is positioned in the bottom right-hand quarter of the display area. The PIA, PIB, and PIC pie charts (if there are any) are positioned in the top left-hand, top right-hand and bottom left-hand quarters respectively.

Options

- Fn** The font of the pie name. The default is F0.
- Sn** The size of the pie name. The default is S4.
- Cn** The colour of the pie name. The default is C1.
- Qn** The colour of the pie segment borders. The default is the colour of the pie segment.
- AS** If you are displaying more than one pie chart, the entry AS ensures that the individual pie chart areas are in proportion to their total values. It overrides any ratio entered in the third cell. For example, if all the values for one pie add up to 5.0 and those for a second pie add up to 10.0, then the second pie will be twice the area of the first.

2nd Cell

The pie name is optional. It may be entered directly as text, or as a cell reference. It is displayed immediately above the pie.

3rd Cell

The ratio is optional. It may be entered as an expression. If you are displaying more than one pie chart, the ratios define the size of each pie in relation to the other pies. For example, if one pie has a ratio of 2 and a second pie a ratio of 3, then the first pie will be two-thirds the area of the second. If neither AS nor a ratio is specified, all pies have the same size.

Notes

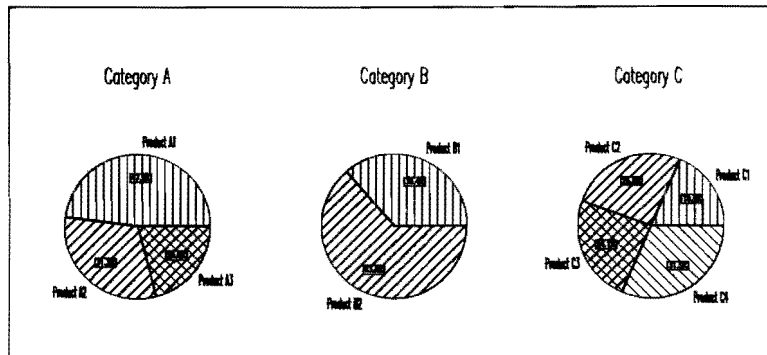
1. To define the segments of each pie chart, use PIE commands.

Example

The following commands define three individual pie charts. The first (named 'Category A') is defined by the PIA command and has three segments defined by PIE commands. The second (defined by the PIB command) has only two segments. The fourth (defined by the PIC command) has four segments. Note how the PIE commands are below, and in the same column as, their associated PIA/PIB/PIC command.

	A	B	C	D	E	F
1	PIA	Category A				
2	PIE	Product A1	23			
3	PIE	Product A2	15			
4	PIE	Product A3	10			
5	PIB	Category B				
6	PIE	Product B1	20			
7	PIE	Product B2	35			
8	PIC	Category C				
9	PIE	Product C1	10			
10	PIE	Product C2	14			
11	PIE	Product C3	13			
12	PIE	Product C4	17			

The graph they produce looks like this:



PIE - PIE SEGMENT DATA

What it Does

- Defines a segment name and value for an individual pie chart.
- Defines a segment name and values for two to four common pie charts.
- Defines the hatching style, thickness and colour of the segment.
- Defines the location of the percentage labels.
- Explodes the segment.

How to Enter It

1st cell: PIE [*Hn*] [*Tn*] [*Cn*] [PO/PI/PN] [EX]

2nd cell: [*segment name*]

3rd, 4th, 5th and 6th cells: *values*

Options

Hn The hatching style used for the segment. The default for **Hn** and **Cn** depends on the other PIE commands, if any

Tn The thickness of the line used for hatching. The default is T1.

Cn The colour of the segment and segment names.

PO/PI/PN There are three options:

PO Percentage labels outside the segment

PI Percentage labels inside the segment (this is the default)

PN No percentage labels

EX If EX is specified, the segment is separated slightly from the rest of the pie chart.

2nd Cell

The segment name is optional. It may be entered directly as text, or as a cell reference. It is displayed next to the segment.

3rd, 4th, 5th and 6th Cells

If you are defining a segment for a PIA/PIB/PIC/PID pie chart, the third cell must contain the value used to calculate the size of the segment. If you are defining a segment for PI2/PI3/PI4 pie charts, the third, fourth, fifth and sixth cells must contain the values used to calculate the sizes of the segment in the first, second, third and fourth pie charts respectively. The values may be entered as expressions or numbers.

Notes

1. There may be between 2 and 10 PIE commands for each pie chart; any more are ignored.
2. The PIE commands must be in the same column as the associated PIA/PIB/PIC/PID or PI2/PI3/PI4 command, and below it.

PI2/PI3/PI4 - COMMON PIE CHARTS

What it Does

- Defines two to four pie charts with common legends.
- Defines the pie names and their font, size and colour.
- Defines the colour of the pie segment borders.
- Automatically scales the size of each pie.

How to Enter It

1st cell: PI2/PI3/PI4 [*Fn*] [*Sn*] [*Cn*] [*Qn*] [*AS*]

2nd cell: *blank*

3rd, 4th, 5th and 6th cells: [*pie names*]

Two, three or four pie charts may share the same legends:

- PI2 Two pie charts; they are positioned alongside each other (or one above the other if the graph is rotated).
- PI3 Three pie charts; they are positioned in a row (or one above the other if the graph is rotated).
- PI4 Four pie charts; they are positioned in the four quarters of the display area.

Options

- Fn* The font of the pie names. The default is F0.
- Sn* The size of the pie names. The default is S4.
- Cn* The colour of the pie names. The default is C1.
- Qn* The colour of the pie segment borders. The default is the colour of the pie segment.
- AS* The entry AS ensures that the areas of the pie charts are in proportion to their total values. If AS is not specified, all pie charts have the same size.

2nd Cell

This should be left blank. Following cells in the same column are used for the segment names in the PIE commands.

3rd, 4th, 5th and 6th Cells

These are the names of the first, second, third and fourth pies respectively. They are optional. They may be entered directly as text, or as cell references. Each name is displayed immediately above the appropriate pie.

Notes

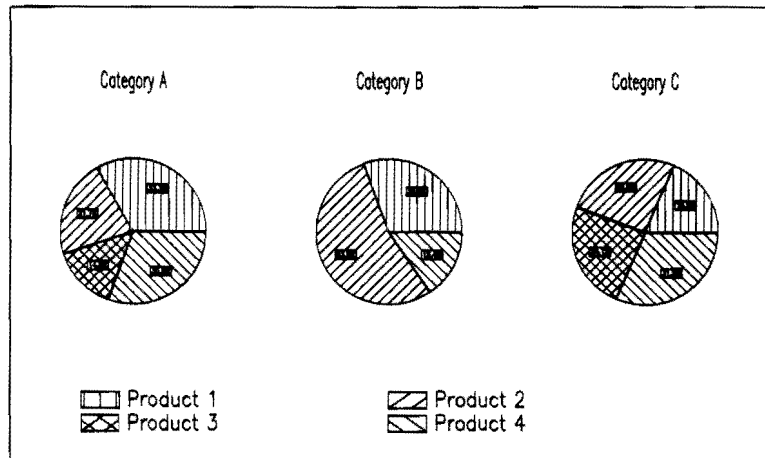
1. To define the segments of the pie charts, use PIE commands.

Example

The following commands define three common pie charts. The PI3 command defines the pie names, while the PIE commands define the values and names of the four segments. Note how the PIE commands are below, and in the same column as, the PI3 command. Note also that, unlike individual pie charts (PIA/PIB/PIC/PID command), all three pies share the same legends.

	A	B	C	D	E
1	PI3		Category A	Category B	Category C
2	PIE	Product 1	23	20	10
3	PIE	Product 2	15	35	14
4	PIE	Product 3	10		13
5	PIE	Product 4	21	10	17

The graph they produce looks like this:



SCT - SCATTERGRAM

What it Does

- Defines the name and values for a scattergram.
- Defines the scatter marker and its colour, font and size.
- Scales the scattergram to the left or right-hand Y axis.

How to Enter It

1st cell: SCT [Rn] [Fn] [Sn] [Cn] [YL/YR]

2nd cell: [scatter name]

3rd, 4th, 5th, . . cells: *scatter values*

Options

Rn Rn defines the character marking each data point:

R0 ×

R1 ○

R2 ∟

R3 □

R4 *

R5 △

R6 ·

R7 ▽

R8 #

R9 ☆

If n is any character other than 0-9, then that character is the marker. The default depends on the other SCT commands, if any.

Fn The font of the scatter markers (when an alphanumeric character is used). The default is F0.

Sn The size of the scatter markers. The default is S4.

Cn The colour of the scatter markers. The default depends on the other SCT commands, if any.

YL/YR There are two options:

YL Values are scaled to the left-hand Y-axis (this is the default)

YR Values are scaled to the right-hand Y-axis

2nd Cell

The scatter name is optional.

3rd, 4th, 5th, . . Cells

These are the values used to calculate the points on the scattergram.

Notes

1. No more than ten scattergrams may be used on one graph.

SET - SET FONT AND COLOUR

What it Does

- Defines the font and colour for all graphs.
- Suppresses all text in graphs.

How to Enter It

1st cell: SET [Fn] [Cn]

Options

- Fn** The font for all text, regardless of any other font commands.
Note: the entry F- suppresses all text.
- Cn** The colour for all graph output, regardless of any other colour commands.

SPV/SPH - SPREAD GRAPH

What it Does

- Defines the name and 'hi-lo' values for a horizontal or vertical spread graph.
- Defines line spreads or floating bars, and their annotations.
- Defines the line style, colour and thickness of line spreads.
- Defines the style, colour and line thickness of the hatching used to fill floating bars.
- Defines the colour of the lines surrounding floating bars.
- Scales the spread graph to the left or right-hand Y axis.

How to Enter It

1st row: 1st cell: SPV/SPH [Hn/Ln] [Tn] [AN] [Fn] [Sn] [Cn] [YL/YR] [Qn]
2nd cell: *[spread name]*
3rd, 4th, 5th, . . cells: *high values*
2nd row: 1st and 2nd cells: *blank*
3rd, 4th, 5th, . . cells: *low values*

There are two types of spread graph:

SPV Vertical spread: lines or bars are vertical.
SPH Horizontal spread: lines or bars are horizontal.

Options

Note: Only one of **Ln** or **Hn** may be entered. If neither is entered, Superplan displays line spreads.

Ln The style of the line spreads. The default depends on the other SPV/SPH commands, if any.

Hn The style of hatching for floating bars. The default depends on the other SPV/SPH commands, if any.

AN If AN is specified, the value of each spread is annotated.

Fn The font of the annotation. The default is F1.

Sn The size of the annotation. The default is S5.

Tn The thickness of the line spreads or hatching lines. The default is T1.

Cn The colour of the annotation and line spreads or hatching. The default depends on the other SPV/SPH commands, if any.

YL/YR There are two options (not applicable to SPH):

YL Graph is scaled to the left-hand Y axis (default)

YR Graph is scaled to the right-hand Y axis

Qn The colour of the box surrounding the floating bars. The default is the colour of the hatching.

1st Row: 2nd Cell

The spread graph name is optional. It may be entered directly as text, or as a reference to a cell containing text.

3rd, 4th, 5th, . . Cells

The first row contains the values of the highest points of the spreads, the second row the values of the lowest points. They may be entered as expressions or numbers.

Notes

1. No more than ten spread graphs may be used on one graph.

STA/END - START AND END OF DATA

What it Does

- Defines the start and end of the graph data set.

How to Enter It

1st cell: STA/END

Entered in any cell, STA marks the column at which Superplan is to start reading data for a graph. END marks the column at which the graph data ends.

Note that if either is outside the current graphics range (see the /View command in Chapter 1), it is ignored.

TAB - TABS

What it Does

- Defines the tab settings for wordslides.

How to Enter It

1st cell: TAB

2nd,3rd,4th,... cells: *tab values*

2nd,3rd,4th,.. Cells

These are the tab settings, and may be entered as expressions or numbers. Each tab indicates a position from 0 to 100 across the display area from left to right.

The default tabs are 10, 20, 30, 40, 50, 60, 70, 80 and 90.

See also the WRD command later in this chapter.

TIA/TIB/TIC - TITLES

What it Does

- Defines a title for a graph.
- Defines its font, size, colour, underline thickness and style.
- Defines its position and justification.

How to Enter It

1st cell: TIA/TIB/TIC [Fn] [Sn] [Cn] [Ln] [Tn] [Qn] [JL/JC/JR]

2nd cell: *title*

3rd cell: [X co-ordinate]

4th cell: [Y co-ordinate]

Up to three titles may be defined for a graph: TIA, TIB and TIC.

Options

Fn The font of the title. The default is F0.

Sn The size of the title. The default is S7 for TIA, S5 for TIB and TIC.

Cn The colour of the title. The default is C1.

Ln The style of any underline. The default is L0.

Tn The thickness of any underline. The default is T1.

Qn The colour of any underline. The default is the colour of the title.

JL/JC/JR This determines where the title is to be placed:

JL The first character is on the X-Y co-ordinates.

JC The middle character is on the X-Y co-ordinates (the default).

JR The last character is on the X-Y co-ordinates.

2nd Cell

This is the text of the title. It is displayed at the position defined by the J option and the X-Y co-ordinates. It may be entered directly as text, or as a cell reference.

3rd and 4th Cells

To change the position of the title, you may specify an X co-ordinate (3rd cell) and Y co-ordinate (4th cell). The X co-ordinate indicates a position from 0 to 100 across the display area from left to right. The Y co-ordinate indicates a position from 0 to 100 up the display area from bottom to top. For example, X and Y co-ordinates of 50 and 75 give a point roughly halfway across and three-quarters of the way up the display area.

The defaults are: **TIA** X = 50, Y = 94
 TIB X = 50, Y = 90
 TIC X = 50, Y = 86

TRG - TRIGGER

What it Does

- Defines a style, colour, thickness and value for a 'trigger' line.

How to Enter It

1st cell: TRG [*L_n*] [*T_n*] [*C_n*]

2nd cell: *trigger value*

Options

L_n The style of the trigger line. The default is L0.

T_n The thickness of the trigger line. The default is T1.

C_n The colour of the trigger line. The default is C1.

2nd Cell

This is the value indicating the position of the trigger line. It may be entered as an expression or number. For clustered bar charts the effect is to display a straight line at the indicated position; bars are then plotted relative to this line.

The effect of the TRG command on other axis types of graph is simply to display a line parallel to the X axis across the graph at the appropriate position.

For Gantt charts simply place the TRG command in the column where the trigger is required. The effect is to outline the column on the Gantt chart. A value is not required.

ULY/ULS/ULX - AXES LIMITS

What it Does

- Defines the upper and lower data limits of a Y axis, secondary Y axis, or X axis.

How to Enter It

1st cell: ULY/ULS/ULX
2nd cell: upper limit
3rd cell: lower limit

Three commands may be entered:

ULY for the Y axis

ULS for the secondary Y axis

ULX for the X axis; note that this is only applicable to X-Y graphs (see the X-Y command later in this chapter). It has no effect on other types of graph.

2nd and 3rd Cells

The upper and lower limits may be entered as expressions or numbers. All values outside these limits are ignored. In fact, you may enter the lower limit in the 2nd cell and the upper limit in the 3rd cell if you wish; Superplan will automatically calculate the correct range.

WRD - WORDSLIDES

What it Does

- Defines text to be displayed at a particular tab setting.
- Defines its font, size and colour, and underline thickness, style and colour.

How to Enter It

1st cell: WRD [*F_n*] [*S_n*] [*C_n*] [*L_n*] [*T_n*] [*Q_n*] [JL/JC/JR]

2nd or 3rd or 4th, . . cell: *text*

Options

F_n The font of the text. The default is F0.

S_n The size of the text. The default is S4.

C_n The colour of the text. The default is C1.

L_n The style of any underline. The default is L0.

T_n The thickness of any underline. The default is T1.

Q_n The colour of any underline. The default is the colour of the text.

JL/JC/JR This determines where the text is to be placed:

JL The first character is on the tab setting (this is the default).

JC The middle character is on the tab setting.

JR The last character is on the tab setting.

2nd, 3rd, or 4th, . . Cell

This is the text. It may be entered directly as text, or as a cell reference. It should be entered in the column corresponding to the required tab setting (see the TAB command).

If no text is entered, Superplan displays a blank line.

Notes

1. As many as 128 WRD commands may be used on one graph.
2. Superplan automatically spaces lines evenly down the display area. That is, it divides the area by the total number of WRD commands you use.

X-Y - X AXIS VALUES

What it Does

- Defines the values for the X axis on an X-Y graph.

How to Enter It

1st cell: X-Y

2nd cell: blank

3rd, 4th, 5th, . . cells: *X axis values*

3rd, 4th, 5th, . . Cells

These contain the values displayed along the X axis. They may be entered as expressions or numbers. Each value should be entered in the column containing the value(s) for that X axis data point.

An X-Y graph positions each data value at the co-ordinates given by the X value from the X-Y command and the Y value from another graph command.

The only sensible graph commands to use are:

SCT to produce an X-Y scattergram.

SPV/SPH to produce a scatter illustrating spreads between high and low values.

LIN to produce a 'join the dots' line diagram which links the successive X-Y co-ordinates.

Other graph types, such as bar charts, require a regularly incrementing X-axis value and therefore should not be used with the X-Y command.

C0-9 AND Q0-9 - COLOURS

The colours corresponding to the colour codes depend on the device used. They are defined by the /View command (see Chapter 1). The default colour code for the first data set on a graph is C1, that for the second is C2, that for the third is C3, and so on. Because C0 usually represents the background colour, it can be used to suppress a particular feature of a graph, for example, an axis.

The Qn modifier is used throughout the different commands to denote the colour of the less important feature. For example, in text commands the Cn modifier defines the colour of the text, while Qn defines the colour of the underlining. Similarly, in axes commands (ACX/ACY/ACS), Cn defines the colour of the axis labels, while Qn defines the colour of the axis itself.

0 Background	5 Black
1 White	6 Blue
2 Cyan	7 White
3 Orange	8 Cyan
4 Magenta	9 Orange

F0-8 - FONTS

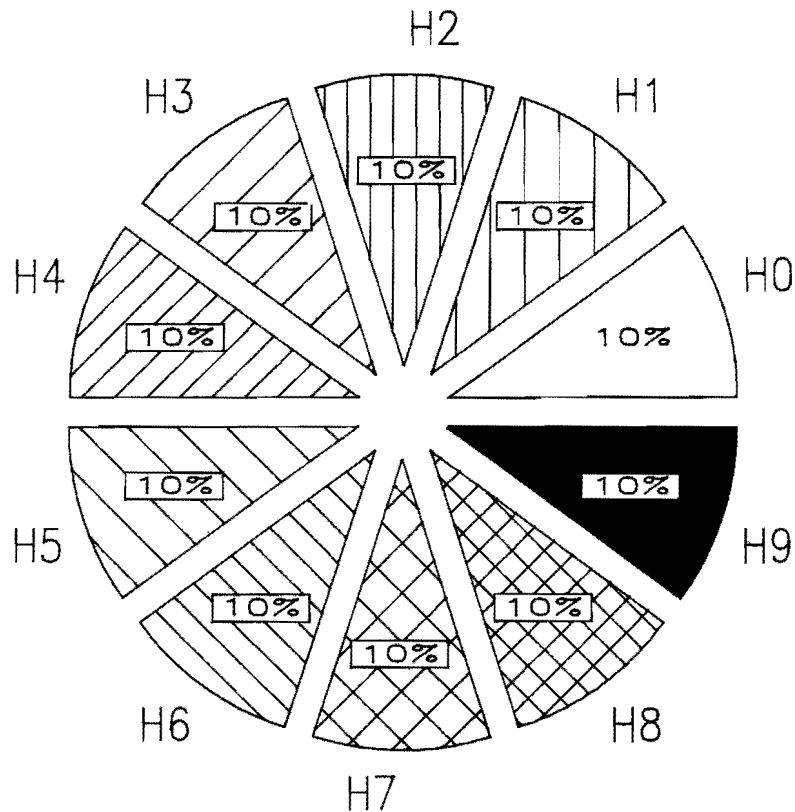
The available fonts are listed in the table below:

Code

F0	ABC abc 123
F1	<i>ABC abc 123</i>
F2	ABC abc 123
F3	<i>ABC abc 123</i>
F4	ABC abc 123
F5	<i>ABC abc 123</i>
F6	ABC abc 123
F7	<i>ABC abc 123</i>
F8	ABC abc 123
F9	ABC abc 123

H0-9 - HATCHING

The available hatching styles are illustrated in the pie chart below. The default hatching style for each data set on a graph is automatically determined by Superplan.



L0-9 - LINE

The available line styles are given in the table below. For colour graphs the default line style is L0. For monochrome graphs the default line style for the first data set on a graph is L0, that for the second is L1, that for the third is L2, and so on.

Code

L0	
L1	
L2	
L3	
L4	
L5	
L6	
L7	
L8	
L9	

S0-9 - SIZE

The available character sizes are listed in the table below. Note that this gives the sizes on landscaped A4 paper; when a graph is displayed portrait or in an area of a different size, the character sizes are changed in proportion.

Code

S0 ABC abc

S1 ABC abc

S2 ABC abc

S3 ABC abc

S4 ABC abc

S5 ABC abc

S6 ABC abc

S7 ABC abc

S8 ABC abc

S9 ABC abc

T0-9 - THICKNESS

The available line thicknesses are given in the table below:

Code

T0	
T1	
T2	
T3	
T4	
T5	
T6	
T7	
T8	
T9	

R0-9 OR R [ANY CHARACTER] - MARKER

The scatter markers R0-9 are listed in the table below. If you use any character other than 0-9, then that character is the marker. The default scatter marker for the first data set on a scattergram is R0, that for the second is R1, that for the third is R2, and so on.

Code

R0	×
R1	⬡
R2	⋈
R3	□
R4	✱
R5	△
R6	•
R7	▽
R8	≠
R9	☆

CHAPTER 5. EXAMPLES

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INTRODUCTION

This chapter describes the example files supplied with Superplan. They are designed to illustrate various uses of Superplan and to help you develop your own applications.

PRINTER	contains a printshop production schedule.
AUDIT	contains a staff plan for a firm of accountants.
COUNTRY	is a large database with which you can experiment.
TULSA	uses a What-if table to cost alternative scenarios for delivering and installing a printing press.
CASHFLOW	is a worksheet used for cash flow analysis.
GRAPHS	contains commands for ten different graphs.
LAUNCH	uses critical path analysis to schedule a product launch.
REGRESS	calculates and displays best fit regression line.
GOALSEEK	is an iterative calculation of an input variable to seek a desired result.

To look at a particular example, load the file using the /Load Superplan command. If your examples are on a separate disk, do not forget to specify the correct drive when you enter the filename.

Each example contains one or more pages of narrative, which explain what the example is and how it works. Read through these pages first, then feel free to examine the example in detail and experiment with it.

PRODUCTION SCHEDULE

The PRINTER file contains a production schedule for three printshop presses. The layout of the worksheet is as follows (each box represents a screen window):

Narrative	Database for press 1	Timesheet
	Database for press 2	
	Database for press 3	

The three databases list all the jobs for each of the three presses. The time required for each job (column E) has been calculated from the data on the set up times and running speeds of each press and the requirements of each job.

The first job is scheduled to start at 9 a.m. on 5th February; subsequent jobs are then scheduled to start as soon as the preceding job is completed. The start times and dates (columns G and H) have been calculated in conjunction with the half-hourly calendar that has been defined and linked to the worksheet.

The lists of jobs have been presented as a timesheet (column I onwards) by defining the first job records in terms of the database information, then using the /Replicate Orthogonal command for the remaining jobs.

STAFF PLAN

The AUDIT file contains a staff plan for a department of a firm of accountants. The layout of the worksheet is as follows (each box represents a screen window):

Narrative (page 1)	Narrative (page 2)	Staff Plan
	Job List and Summary	
	Fees and Costs	

Cells B20 to G30 contain the database of jobs and clients. A weekly staff plan (columns I to X) for the seven members of the department has been generated for the first quarter of 1985. The start and finish dates have been obtained from the staff plan and put into the job list (columns E and F).

Using the /Table Query Extract command, a summary of the jobs completing in February has been prepared (C32 to F39). The time cost for each of these jobs (F35 to F37) has been calculated by multiplying the appropriate daily chargeout rate (column K) by the length of time each member of staff spends on the job.

Beneath the summary the non-chargeable time costs (F43 to F47) have been calculated for February.

Finally, you can see a Gantt chart of the staff plan by using the /View Screen command. The GAN graph commands define the rows of the chart, while the JOB graph commands identify the different activities:

A,B & C Co., Chartered Accountants

WEEKLY STAFF PLAN

	January				February				March			
	7	14	21	28	4	11	18	25	4	11	18	25
Douglas	ADMIN	AUDIT 1	ADMIN	AUDIT 2	ADMIN			AUDIT 3				
Charles	ADMIN		AUDIT 2		TAX 2			AUDIT 3				
Kathy		AUDIT 1		AUDIT 4	TAX 1		MERGER					
Brian	HOLIDAY		AUDIT 2		TRAINING			AUDIT 3				
Emma		AUDIT 1	HOLIDAY	TRAINING				AUDIT 3				
Julie		AUDIT 1		AUDIT 4	TAX 1			TRAINING				
Chris	ADMIN		AUDIT 2								TRAINING	

First Quarter 1985

DATABASE

The COUNTRY file is a large database comprising a list of the countries of the world, including capital city, population, area and Gross National Product. The layout of the worksheet is as follows:

Narrative	Criterion Range and Output Range
Database	

The named range DATABASE (A22 to E185) contains all the records and the field names. The criterion range has been named CRIT1 (for one line of criteria) and CRIT2 (for two lines). The output range (G13 to K13 and downwards) has been named OUT.

Enter some criteria in the criterion range, then experiment with the /Table commands using these named ranges to find records or copy them. You can also try out the database functions to perform calculations on selected records and fields.

WHAT-IF TABLE

The TULSA file uses a what-if table to cost alternative scenarios for delivering and installing a printing press in Tulsa in the United States of America. The layout of the worksheet is as follows (each box represents a screen window):

Narrative (page 1)	Assumptions	Plan
Narrative (page 2)	Costs	
Narrative (page 3)	What-if Table and Graph	

The times for the different activities and the related costs have been entered as assumptions in C1 to G19. The times have been used to create an activity plan initially based on one man doing the work. The number of men involved can be changed in cell U2.

The total costs (C21 to F32) have been calculated using values from the plan for the number of man-days and the completion date. You can experiment by changing the number of men (U2) and the shipping method (U3), then recalculate to see how the plan and costs are affected.

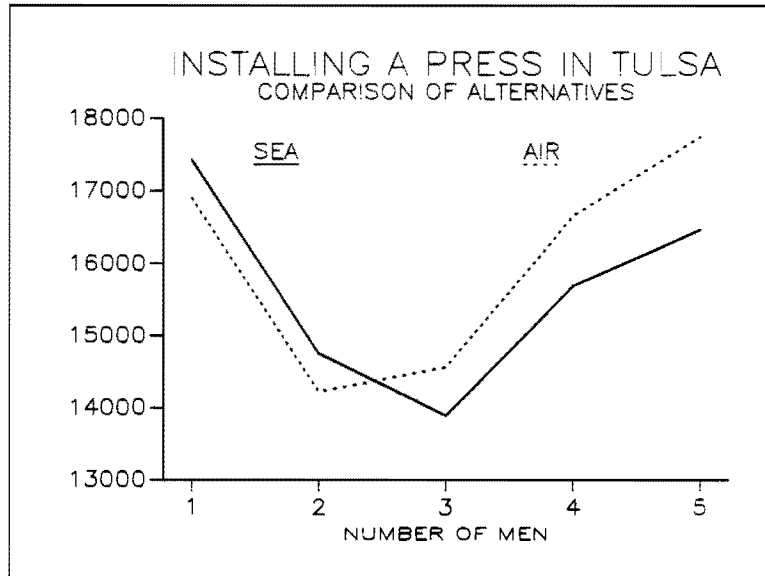
In the named range TABLE (C42 to H44) a double-value what-if table has been constructed, whose purpose is to calculate the total cost (F32) for each one of the ten combinations of shipping method (C43 and C44) and number of men (D42 to H42).

To calculate the results for this table, use the /Table What-if command and select the Double-value option. Then in response to the prompts, enter:

Table Range:	TABLE
Input Cell 1:	U3
Input Cell 2:	U2

What-if Table

When Superplan has calculated all the values, you can view this in graphical form with the /View Screen command. The cheapest method is represented by the lowest point on the graph:



CASHFLOW ANALYSIS

The CASHFLOW file is concerned with evaluating an investment proposal firstly in terms of a profit and loss projection, and then in terms of a detailed cashflow analysis. The layout of the worksheet is as follows (each box represents a screen window):

Narrative (page 1)	Assumptions	Trading Account Profit/Loss Cash Flow
Narrative (page 2)	Maximum Cash Outlay and Net Present Value	Net Cash Flow Cumulative Cash Flow Graph
Narrative (page 3)		

Since the cashflow analysis is a weekly analysis extending over a period of two years, the forecast covers over 100 columns.

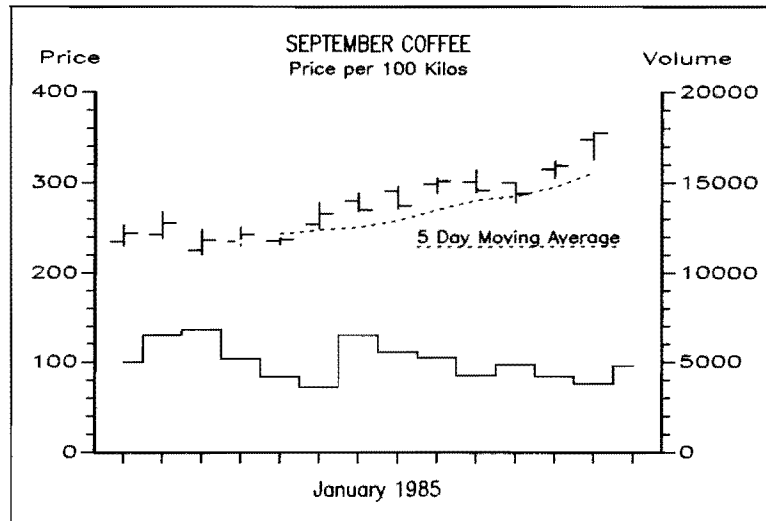
A detailed description of this example is given in the narrative.

GRAPHS

The GRAPHS.SP file is organised in such a way that you can move from each complete set of commands to another using only the PAGE DOWN or UP keys. Each set of commands lies within a named cell block, so to view each graph on screen, issue a /View Range command followed by the appropriate name, then a /View Screen command. To print or plot a graph, set the device options by issuing a /View Options command, then issue /View Print or /View Draw.

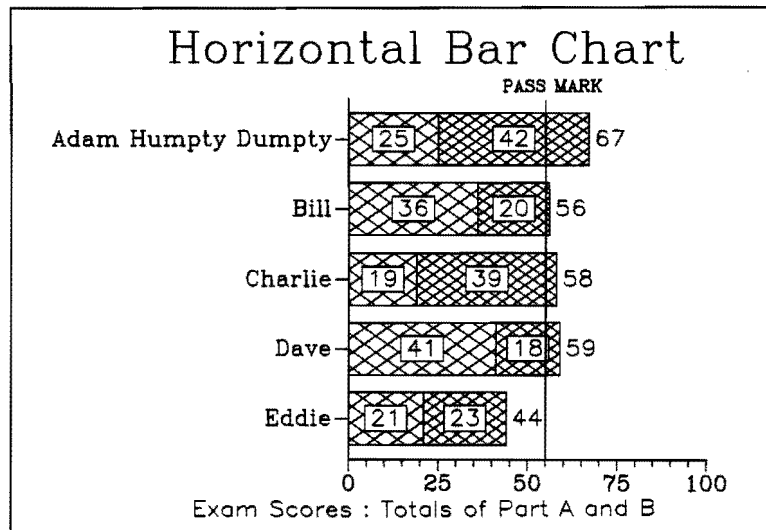
COFFEE

This produces an open, high, low, close graph using spread, and tick left and right commands. Volume figures are displayed as a step graph on a second Y axis. The calculated delayed moving average is displayed as a dotted line.



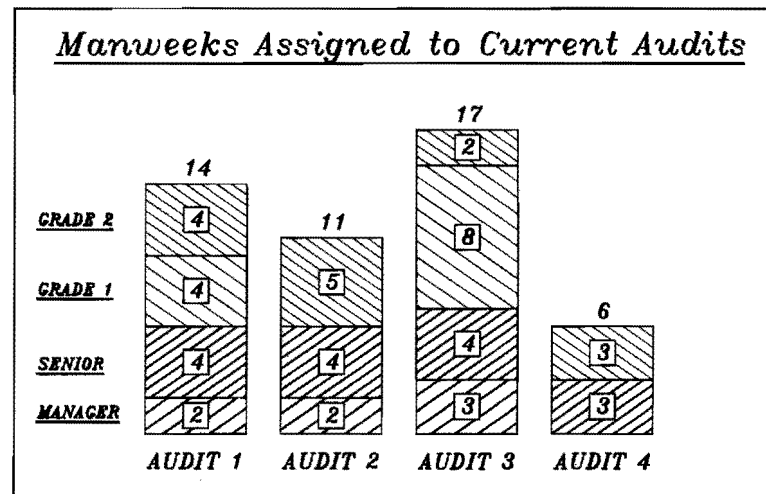
SCORES

This shows a horizontal stacked bar chart with value annotations. Note that the vertical axis is automatically positioned to allow for the size of the largest label. The trigger line is used to show the pass mark. A variety of font styles are used.



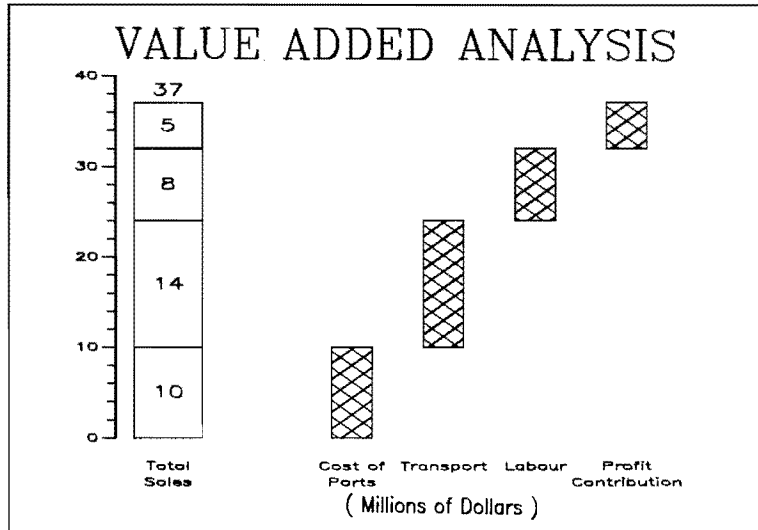
AUDITS

This shows a vertical stacked bar chart with value annotations. The X axis, Y axis and Y axis labels are suppressed by the use of the C0 and Q0 modifiers in the ACX and ACY commands



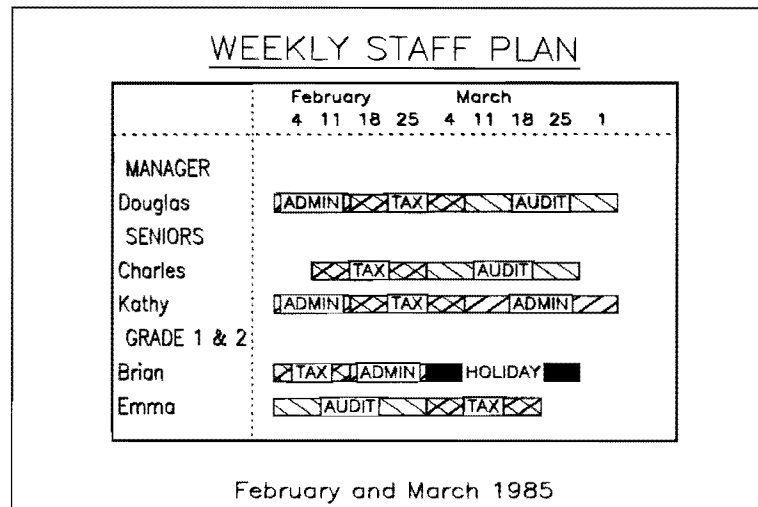
VALUE

This shows a combination of vertical stacked bars generated by the BVS command and floating bars generated by the SPV command to emphasise the breakdown of the total value. Note that two lines are used for the X axis labels.



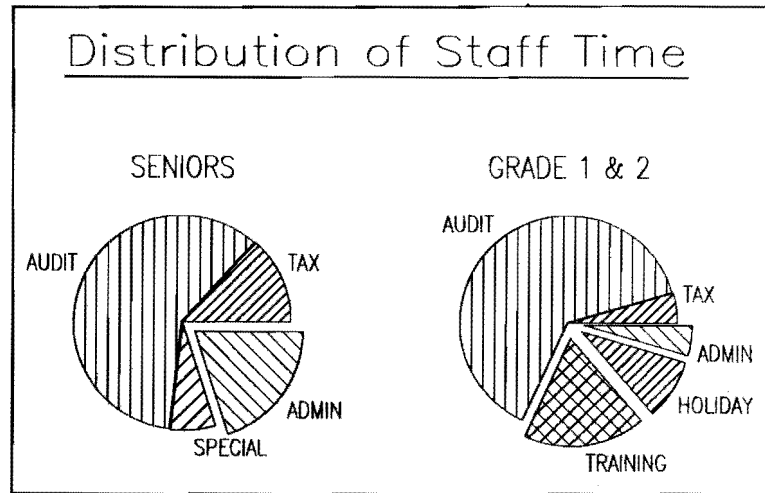
GANTT

This Gantt chart is used to illustrate an activity plan. It picks up job records and displays them as labelled horizontal boxes.



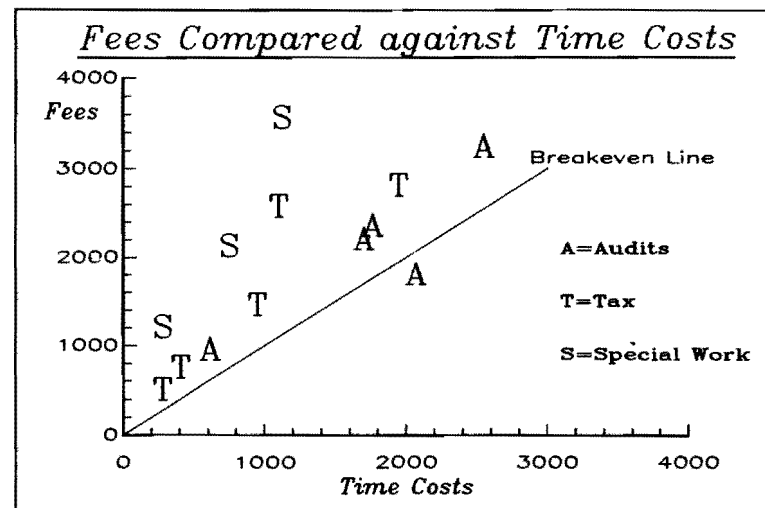
PIES

These two pie charts illustrate a variety of hatching styles. Non-chargeable time is emphasised by exploded segments.



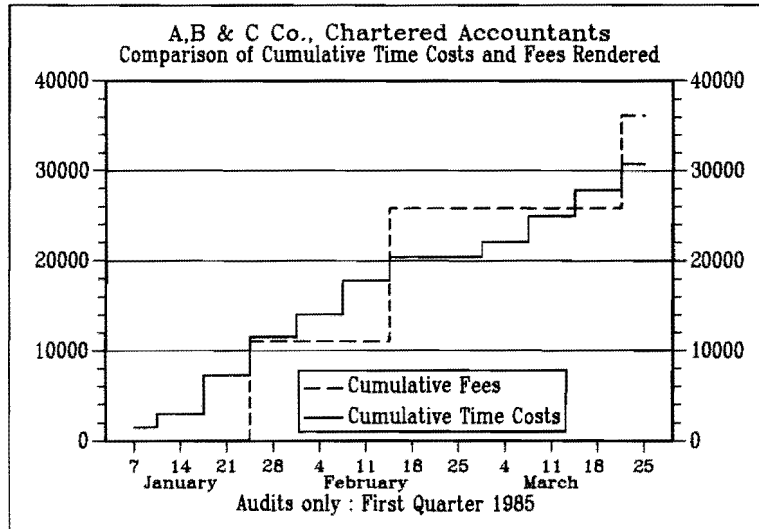
SCATTER

This is an X-Y graph illustrating the use of characters to mark the scatter points for three different data sets. The break even line is created by a standard lin command.



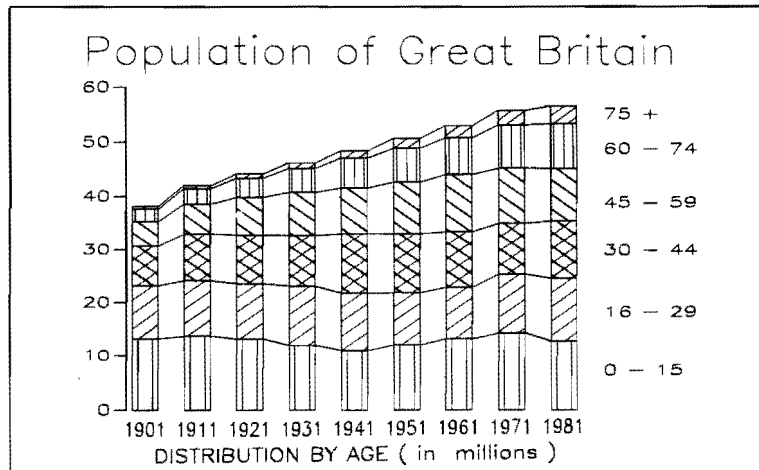
STEPS

This sums and plots weekly costs and fees in the form of step graphs comparing cumulative values. A simple grid is added between the major Y axis ticks using the GRY command; the Q0 modifier suppresses the intermediate grid lines.



AGES

This stacked bar chart illustrates the use of the LB modifier to link the bars with connecting lines between segments. The width of the bars is set to 50% in the BVS command and the X axis is suppressed. The Y axis is set to six major divisions with no small ticks in between.



ANNOT

This illustrates the use of the ANN (annotation) command to generate a text-only slide. (Plotted onto acetate, this command can be used to generate high quality slides for overhead projection.) The JL, JC and JR modifiers allow text to be justified left, centre or right relative to the X and Y co-ordinates entered in columns C and D.

LOGISTIX

The Integrated Software System that
Adds The Fourth Dimension of TIME

TIMESHEET
DATABASE

SPREADSHEET
GRAPHICS

THE BEST IDEA IN BUSINESS SOFTWARE
SINCE THE SPREADSHEET
A Program by GRAFOX

CRITICAL PATH ANALYSIS

The LAUNCH file uses critical path analysis as an aid in scheduling a product launch. It has been designed so that when you hold down the CTRL key and press the A key, it produces a 'rolling demonstration' of how the /Kritical command identifies a critical path and how it is automatically adjusted when changes are made to an activity in the schedule.

If you wish to look at the file without the rolling demonstration, the job database is in cells A1 to D8, the schedule is on rows 11 to 19, and the cost calculations are in A21 to B30. (Rows 34 to 73 contain narrative).

MACROS

The REGRESS and GOALSEEK files are designed to supplement the worked example in Chapter 6 and show you more ways in which macros can be used. When you have loaded one of them, run it to see what it does, then examine the macro itself to see how it works. Neither of the macros is protected by /Xecute Boundary.

REGRESS.SPP	calculates and displays best fit regression line.
GOALSEEK.SPP	is an iterative calculation of an input variable to seek a desired result.

CHAPTER 6. PROGRAMMING

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INTRODUCTION TO PROGRAMMING

Under /Auto in Chapter 1 there are details of how you can automate commonly used procedures so that you do not have to re-type long sequences of commands and data entries. The purpose of this chapter is to describe more extensive features of Superplan and to show you how, using a small number of additional commands and some simple programming techniques, you can develop quite sophisticated applications and even 'customise' Superplan for your own purposes.

You do not have to be a programmer to use these facilities; in fact, if you have created some autos using the /Auto command, you have already started to understand some of the principles of programming.

Using the facilities described under /Auto and in this chapter, you can automate procedures and change the way Superplan looks to the user, so that it appears specifically designed for a particular application. Such applications may range from relatively simple jobs like entering names and addresses into a customer database, to more complex tasks such as creating invoices automatically or scheduling jobs.

The next section explains what a Superplan application consists of; the chapter then goes on to describe how you can design, create, run, test and protect your own applications. Some additional commands are described in detail, followed by a summary table of all the commands available.

Finally there is a worked example to show you how Superplan programming works in practice.

ELEMENTS OF AN APPLICATION

Superplan applications consist largely of autos and macros. As described under /Auto in Chapter 1, an auto is a sequence of keystrokes assigned to a particular key. A macro is similar to an auto in that it consists of a sequence of keystrokes that issue commands or accept data. But whereas autos do not appear anywhere on the worksheet, but are simply assigned to certain keys, macros are entered like text in partial columns of cells.

There is no limit to the size of macros other than your system's memory capacity. While autos are designed for simpler uses and can only process a limited linear sequence of keystrokes, macros offer a full complement of programming tools, including conditional branching, subroutines and menu creation.

In a typical application the autos and macros perform such tasks as loading files, prompting the user for input, performing calculations on the input data, and displaying and printing information. In addition they can be used to manipulate the entire appearance of an application, in computer jargon, its user interface.

Using simple commands you can suppress the normal appearance of the Superplan worksheet and replace it by prompts or entire screens of your own design. For example, if your application includes a simple method for entering names and addresses, you could replace the normal appearance of the worksheet by the following prompts:

Surname:
First names:
Company:
Address:
Town/City:
Postcode:

So the final elements of an application are these specially designed screens to be manipulated by the autos and macros.

DESIGNING AN APPLICATION

This chapter is not intended to teach you how to become an expert applications programmer, so if your application is particularly large and complex it may be advisable to enlist the help of someone who has programmed before. However, if this is your first introduction to programming, there are some simple ground rules that can make your task easier.

1. Establish the overall purpose of the application.
2. Decide what input data is required, and whether it will come from existing files or from the user. For example, if the purpose of your application is to update a job schedule, then the current schedule will come from an existing file, while the new information will come from the user.
3. Decide what information is to be output from the application and in what format: whether in graphical form or otherwise, whether printed or displayed, and so on. For example, in a job schedule update the visual output could be a new Gantt chart; other output would almost certainly include a file containing the updated schedule.
4. Design the user interface, that is, what the user will see of the application: what the screen is to look like, what prompts the user will be given, how the output data will be organised, and so on. In a job schedule, for example, the user may need to be prompted for each new job name, its length, its start date, and so on.

At this stage you will have a fairly good specification of your application. Your next step is to define what Superplan must do in order to achieve the required results. If the application is relatively simple you could start entering autos and macros immediately.

However, if the application is large and complex, you should start by dividing it into smaller and more manageable segments. For example, if your application creates personalised letters you could divide it into two segments: one for entering the names and addresses and the other for creating and printing the letters.

Dividing an application into smaller segments not only makes it easier to write, but also makes it easier to test. When you have finished writing and testing, you can join the segments together using simple commands.

CREATING AN APPLICATION

When you are ready to start writing your application in the form of macros, autos and special screens, you must decide how much of the worksheet is to be reserved for them. Normally you will use the far right of the worksheet, so that the remainder is available for the user.

An auto does not occupy any room on the worksheet, but is only a sequence of characters assigned to a particular key. You may have as many as 254 characters in a single auto. A macro, on the other hand, is entered in successive cells of a column, and so takes up room on the worksheet. For example, the first few lines of a macro may look like this:

	AAA	AAB	AAC
1			
2			
3			
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5			
6			
7			
8			
9			
10			
11			
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253			
254			

The commands used in this example can all be used within autos so you should have no difficulty in understanding what the macro does. It blanks the range A1:E20, then replicates whatever is in range AAE1:AAI20 (a series of data entry prompts, say) into the blank area. It then waits for input to cell C5, followed by input to C6.

You should note the following points:

1. Macros are entered in the worksheet in exactly the same way as text.
2. For clarity, a macro should be divided into separate lines. This is an important consideration when you need to test and change your macros or when other people need to understand your work.
3. No line of a macro can exceed 254 characters.
4. Successive lines of a macro must be entered in successive cells of the same column. Superplan interprets a blank cell as the end of a macro.
5. You may start a new line of a macro at any point except in the middle of an individual command.

One way of entering a macro into the worksheet is simply to enter the data and macro commands into the appropriate cells just as if they were pieces of text. However, this means that you have to type in all the four-character codes for the non-alphanumeric keys, which takes time and increases the risk of mistakes.

You can minimize these problems by selecting the Learn option of the /Xecute command (see Chapter 1). If you enter /XL Superplan first asks for the reference of the cell in which the first entry of your macro is to appear. From then on every key still performs its normal function, but it also automatically appears on the entry line in its macro command form.

Pressing the TAB key indicates the completion of each line; the contents of the entry line are moved to the appropriate cell of the macro and you may now type the next line. To exit from Learn, press the TAB key twice.

Note that only those commands that correspond to specific keys on the keyboard can be entered automatically by Learn; commands that do not correspond to specific keys must be entered in full as text.

RUNNING AN APPLICATION

If your application is designed to be run at various times during normal use of Superplan (ie it is not a completely freestanding application), the simplest way of running it is to create an auto consisting of a `>RUN` command (see under `/Auto` in Chapter 1) which runs the first macro in your application.

Successive macros in the application can be 'chained' together by ending each macro with a `>RUN` command calling the next macro in the chain. As you can see later in this chapter, the `>SUB` command (which can only be used in macros) allows you to call a macro from within a macro then return control to the point immediately following the `>SUB` command.

You can also use the `>ALT`, `>CTL` and `>FUN` commands to run autos from within your application.

If you define your first macro in a range named `START` (see the `/Name` command in Chapter 1), this macro is automatically run when the application is loaded. In this way you can mask the Superplan environment completely from the application user.

TESTING AN APPLICATION

When you are writing autos and macros, you frequently need to try them out to see if they work as they should. Often, however, Superplan performs the autos and macros too fast for you to see where any mistakes are.

In this case you can select the Step option of the /Xecute command (see Chapter 1). If you enter /XS, when you now execute a macro or auto, Superplan pauses before each command, so that you can see exactly where any error occurs. To perform the next command, press any key. To cancel step by step operation, press the ESC key.

If Superplan detects an error in your macro (for example, a misspelt command, or an omitted \ character), the macro stops, control returns to the worksheet, and Superplan displays the error message:

INVALID AUTO OR MACRO COMMAND

PROTECTING AN APPLICATION

In a typical application, you will want to ensure that the user cannot inadvertently move to the part of the worksheet containing the inner workings of the application, the macros, menus, screens, and so on. To do this, use the Boundary option of the /Xecute command to limit the area of the worksheet that will be visible to the user.

When you enter /XB Superplan asks you to enter a password. This is saved and loaded with the worksheet whenever the worksheet is saved or loaded, and so prevents unauthorised users removing your boundary and thus accessing your work.

To specify a boundary, enter the alphabetic reference of the first column of the worksheet area you wish to protect.

MACRO COMMANDS

All the commands that are described under /Auto in Chapter 1 are also available in macros. However, there are some additional commands that are not available in autos, and these are described on the following pages. The full set of macro commands is given in the next section.

CEL

This command may be used instead of a specific cell reference to refer to the current cell. For example:

>IFTCEL = 10\>MCD

moves the cursor down to the next cell if the value of the current cell is 10. (The >IFT command is described below, the >MCD command under /Auto.)

>IFTCEL

tests whether the cell contains anything at all. For example:

>IFTCEL\>MCD

moves the cursor down if the current cell is not empty.

>INC>CEL

increments the numerical value of the current cell. (The >INC command is described below.)

>EOF and >EON

Normally when a macro is being run, the user can escape from it by pressing the ESC key. However, if you do not want to give the user this option, use the >EOF command, which switches off the ESC key option. The >EON command switches it back on.

A typical use of >EOF and >EON is when you create a macro consisting of a repeated cycle, say, for entering records into a database. In this case you may want to prevent the user from leaving the macro halfway through a record, but provide the ESC option at the end of each record. For example, the following commands start in cell AAA1:

```
> EOF
> MES Enter name:\> INP> ENT
> MCR> MES Enter telephone no:\> INP> ENT
> MCD> MCL
> EON
> MES Press any key to continue, ESC to end\> KEY
> RUNaaa1
```

They form a simple macro for entering names and telephone numbers in two columns. The > EOF command switches off the ESC option, and the next two lines prompt for and enter the name and telephone number in two adjacent cells. When the cursor is positioned for the next record, the ESC option is switched back on and the user can choose whether to exit or to continue. If he presses ESC, Superplan exits the macro; if he presses any other key, the ESC option is switched off again and the macro is repeated.

You should take particular care when using the > EOF command that you do not create loops within your macros from which the user cannot escape.

ERR and >ERTrange

The > ERR command enters the number of the current error message in the current cell. If there is no error message on the status line, it enters 0. For example:

```
/WH>ERR>ENT
```

attempts to split the screen into two horizontal windows. If the cursor is incorrectly positioned, the number 25 (for the INVALID CURSOR POSITION error message) is entered in the current cell.

The > ERTrange\ command enters the text of the current error message into the first cell of the specified range. If there is no error message on the status line, nothing is entered. For example:

```
/LL graphs >ENT>ENT>ERTa1\
```

attempts to load the Superplan file GRAPHS.SPP. If an error occurs during loading (eg FILE NOT FOUND), the error message is entered in cell A1.

HIDmessage\ and >SHO

The > HID command blanks the entire screen so that the user cannot see what the macro is doing, and displays the specified *message* left-justified on the middle row of the screen. This can be used to hide the inner workings of a macro from the user or to tell him what is happening during a long procedure.

For example, if you wish to copy a pre-designed screen from the far right of the worksheet to the area in which the user is working:

```
HID Please wait for next screen\  
/R>ENTaaa1:aae20,a1>ENT  
>SHO
```

blanks the screen while the replication is being performed and displays the explanatory message.

The > SHO command returns Superplan to the normal display of what is being performed by a macro, after it has been hidden by a > HID command.

> IFTcondition

The **> IFT** command allows processing to continue along different paths, depending on the result of the specified test. If the *condition* is true (ie has a non-zero value), processing continues with the commands immediately following the **** character. If the *condition* is false (ie has a zero value), processing continues with the command(s) in the next cell down.

This command allows you to test the worksheet for certain values, then perform an appropriate procedure for the value found. For example:

```
> IFTe10 <= 100\ > RUNabb25
> IFTe10 <= 200\ > RUNabb40
> IFTe10 <= 500\ > RUNabb92
> MES Limit exceeded\ > RUNabb127
```

tests the value of cell E10. If it is 100 or less, the macro at cell ABB25 is run; if it is between 101 and 200, the macro at cell ABB40 is run; if it is between 201 and 500, the macro at cell ABB92 is run; if it is 501 or more, a message is displayed and the macro at cell ABB127 is run.

The full range of logical operators and functions is available for creating the conditional tests; see Chapter 1 for detailed information.

> INCcell and > DECcell

The **> INC** command increments the number in the specified *cell* by 1. The cell must either be blank or contain a number (not an expression). If it is blank, then the number 1 is entered in it.

This command is particularly useful for counting the number of times a macro goes through a loop. For example, if the following macro starts in cell ABC1:

```
> IFTaa1 = 10\ > QIT
> INP > ENT
> INCaa1
> RUNabc1
```

it accepts ten successive inputs. After each input it increments the value of cell AA1, then before it prompts for the next input, tests the value of cell AA1. As soon as the value reaches 10, the macro quits.

The **> DEC** command is identical to the **> INC** command, except that it decrements the number in the *cell* by 1, rather than incrementing it.

> MENrange\name

The MEN command allows you to develop menus of options and help lines which work in the same way as the slash command options in Superplan. The range defines the location of the menu and the name is the name of the menu. A simple menu is shown below:

	ADD	SHOW	DELETE
1	Enter	Show	Delete
2	Enter a new record	Display a record	Delete a record
3	>RUNadj1	>RUNadj10	>RUNadj20
4			

This illustrates the rules for using this command:

1. The first row of the menu must contain the options to be displayed on the prompt line.
2. Each option must occupy a separate cell.
3. All the options must start with different letters (or numbers).
4. No more than 32 options may be specified. They should not occupy more space than is available on the prompt line.
5. The second row of the menu must contain the individual descriptions of the options; these are displayed on the help line when the cursor is moved to each option.
6. The third and subsequent rows must contain the individual macros invoked by the choice of each option.

The command for calling the above macro could be:

> MENadd1:adf3\DATABASE UPDATE:

When it is invoked, the prompt and help lines display the options:

DATABASE UPDATE: Enter Show Delete
ENTER Enter a new record

and each option may be selected either by pointing or by typing its first letter. The macro associated with the chosen option is then run.

An option can invoke a further menu of options if required. For example, the command >RUNadj1 associated with the first option in the example above may invoke another >MEN command. In this way menu trees can be constructed with many levels.

>QIT

The **>QIT** command quits the running of macros and returns control to the keyboard. In conjunction with the **>EOF** command (which switches off the ESC option), this command can give you control over how a user may exit your application (if at all). For example, if your application is menu-driven, one option on the main menu could be to quit the application. The macro for this option would end with a **>QIT** command.

>SOF and >SON

The **>SOF** command switches off the display of the status line. The **>SON** command switches it back on. Note that it is automatically switched back on when macros are not being performed.

The most common use of the **>SOF** command is when you wish to show only your own messages. But take particular care that you do not prevent the user from seeing important status information, such as error messages.

>SUBrange\ and >RET

The **>SUB** command calls another macro (where *range* is its location), runs the macro, then returns to the command immediately following the **>SUB** command. The called macro is known as a subroutine. If you specify a range, Superplan performs all the commands starting at the top left-hand cell of the range until it reaches a **>RET** command. If you only specify a cell reference, it performs all the commands until it reaches a **>RET** command.

The **>RET** command must be the last command of a subroutine called by a **>SUB** command. It ensures that processing continues in the calling macro at the command immediately following the **>SUB** command. If **>RET** is omitted, control does not return to the calling macro. If a **>RET** command is encountered before a **>SUB** command, processing stops.

Note that a subroutine may also call a second subroutine, and that the second subroutine may call another, and so on. This facility is called nesting, and you may have as many as 20 levels of nesting.

One of the main advantages of being able to call macros from within other macros is that you need only write commonly used procedures once. You can then call them whenever you need them. For example, you may have a main menu set up in the range AAA1:AAE20, which you frequently display in the top left of the worksheet. The subroutine for this could be:

```
>HOM
/Ba1:e20>ENT
/R>ENTaaa1:aae20,a1>ENT
>RET
```


You can run this whenever you like simply by including a **>SUB** command in the calling macro. If you named the range containing this subroutine **MAINMENU**, say, then the correct command would be:

>SUBmainmenu

Notes on Ranges

Where a macro command requires a range the following points apply:

1. Although the range must normally be followed by a backslash, where the macro command is the last item in the cell the backslash may be omitted.
2. The bottom right-hand position of the range specified does not affect the execution of the macro command. The range actually used starts at the top left-hand corner of the specified range, and ends at the first blank cell.

Macro commands use ranges (as opposed to cells) to allow the use of named ranges.

COMMAND SUMMARY

Command	Key/Button	Function
> MCR	→	Move cursor right
> MCL	←	Move cursor left
> MCU	↑	Move cell cursor up, or switch between insert and overwrite on entry line
> MCD	↓	Move cell cursor down, or delete entry line character
> HOM	HOME	Move cursor to top left, or to start of entry line
> END	END	Move cursor to end of entry line
> PGL	F9	Move cursor left a page
> PGR	F10	Move cursor right a page
> PGD	SHIFT ↓	Move cursor down a page
> PGU	SHIFT ↑	Move cursor up a page
> ENT	↵	Complete entry
> ESC	ESC	Cancel operation
> BAK	BACKSPACE	Delete character left
> DEL	DELETE	Go up one level
> HLP	F1 HELP	Get help
> FIL	F2 FILES	Display directory
> ALT <i>a</i>	ALT A to Z	Run an auto (<i>a</i> = A to Z)
> ALT <i>n</i>	ALT 0 to 9	Run an auto (<i>n</i> = 0 to 9)
> CTL <i>a</i>	CTRL A to Z	Run an auto (<i>a</i> = A to Z)
> FUN <i>n</i>	F1 to F10	Run an auto or execute a predefined function key (<i>n</i> = 1 to 10)

The following commands have no keyboard equivalents:

> BEL	Keyboard beep
> IFF <i>filename</i> \	Dump graph to disk in .IFF format
> INP	Wait for keyboard input
> KEY	Wait until key pressed
> MES <i>message</i> \	Display <i>message</i> on prompt line
> POF	Turn off prompt and help lines
> PON	Turn on prompt and help lines
> REP <i>n</i>	Repeat previous key <i>n</i> times (<i>n</i> = 1 to 99)
> REW	Start auto again
> RUN <i>range</i>	Run macro in <i>range</i>
> WA <i>n</i>	Wait <i>n</i> seconds (<i>n</i> = 1 to 99)

The following keys can only be used in macros:

> CEL	Current cell reference
> DEC <i>cell</i>	Decrement contents of <i>cell</i>
> EOF	Disable ESC key
> EON	Enable ESC key
> HID <i>message</i> \	Hides screen activity and displays <i>message</i>

Command Summary

> IFT <i>condition</i> \	If <i>condition</i> true, continue; if <i>condition</i> false, go to next cell
> INC <i>cell</i>	Increment contents of <i>cell</i>
> MEN <i>range</i> \ <i>name</i>	Display menu called <i>name</i> stored in <i>range</i>
> QIT	Quit macro and return to keyboard
> RET	Return to the calling macro
> SHO	Cancel > HID command
> SOF	Disable status line display
> SON	Enable status line display
> SUB <i>range</i> \	Call macro stored in <i>range</i>

EXAMPLE: A SIMPLE DATA ENTRY APPLICATION

This example shows you how to design and create a typical application for entering names and addresses into a database. The names and addresses can be of suppliers, clients, prospects, staff or whatever; once they are entered they can be used for mailshots, invoices, statements, payslips and many other purposes.

Designing the Application

In Superplan, databases occupy columns of the worksheet. For example, all the surnames occupy one column, all the forenames the next, the company names the next, and so on. (See Chapter 3 for more information.)

With the field names occupying the top row of the database, it can be a fairly straightforward matter for an experienced Superplan user to enter new names and addresses directly, without the need for a specially designed application. With a specially designed application, however, even a user who has had no experience of Superplan would find it easy to enter data; he would not have to worry about where the cursor should be, what column he was in, whether the column was wide enough, and so on.

This, then, is the overall purpose of the application: to enter names and addresses into a database and to make it easy enough for an inexperienced user to operate. Apart from the application file itself, all the input (the names and addresses) will come from the user. The output will simply consist of the completed database.

The user interface, that is, the part of the application that the user sees, will be a series of prompts for each name and address. For the purposes of this example, the database consists of the following fields:

Surname
Forename(s)
Address
Town/City
Postcode

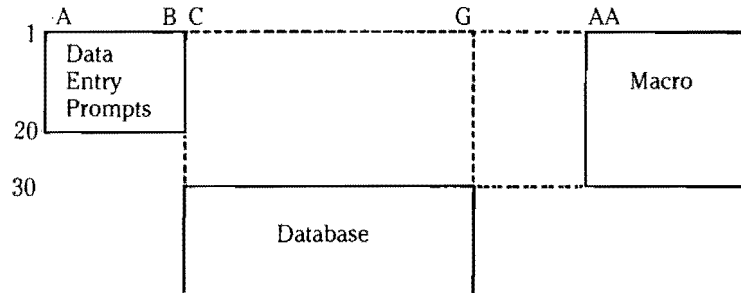
ie five columns. So for each name and address the user needs to be prompted for these five fields, with each prompt on a separate line. These could be in the top left-hand corner of the worksheet.

The database itself needs five columns (one for each field) and should be to the right of the data entry area so that you can design special formats for the columns of the database without affecting the columns of the data entry area. For reasons that will become clear later, it should also be below the data entry area. For example:

	C	D	E	F	G
30	Surname	Forenames	Address	Town	Postcode
31					
32					

Finally you need an area of the worksheet for the macro that is going to perform the application. This should be well to the right of the other two areas, so that it is not affected by the data the user will enter and can be protected from unauthorized access.

A reasonable division of the worksheet is therefore as follows:



You are now ready to design these areas in more detail. First of all, format columns C to G for the database fields and enter the field names in cells C30 to G30, as shown above. Apart from setting the column widths, no other formatting options need be changed. You can set the column widths to whatever seems appropriate for the individual fields.

Next, format columns A and B for the data entry screen and enter the prompts in column A. Column A should be at least 15 characters wide (for a reason that will be given later) and column B should occupy the rest of the screen so that reasonably long addresses can be entered. Enter the prompts as follows:

	A	B	C
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			

SURNAME:
 FORENAME(S):
 ADDRESS:
 TOWN/CITY:
 POSTCODE:

Entering the Macro

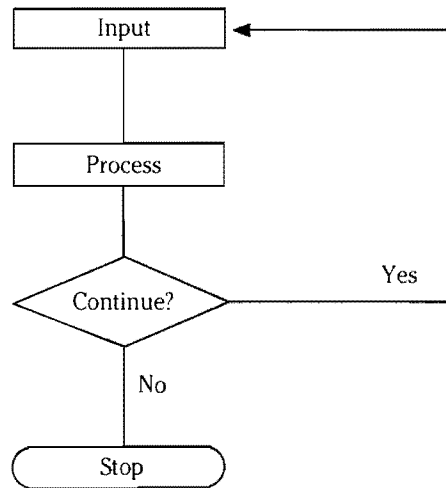
You are now ready to start entering the macro. As was mentioned in an earlier section, you can do this semi-automatically using /Xecute Learn, or enter each command manually as text. If you use the /XL option, Superplan first asks you to enter the reference of the first cell of the macro, which in this case is AA1.

For this example, however, it is assumed that you will be entering the macro manually as text. So start by moving the cursor to cell AA1.

Essentially, the operation to be performed divides into three main parts:

1. Entering the input, ie entering a name and address.
2. Processing the input, ie moving the name and address to the database.
3. Choosing whether to stop the application or continue with another name and address.

This can be shown as a simple **flowchart**:



Input

To prompt the user for the input, the prompts must be on the screen and the cursor must be positioned next to the first prompt. The commands are:

> HOM = b6 > ENT

The **> HOM** command (the HOME key) ensures that cells A1 to B20 are on screen, and the **= b6 > ENT** command (equivalent to **= Goto**) moves the cursor to cell B6, next to the SURNAME: prompt.

The command for awaiting input from the user is **> INP**, which must be followed by **ENT**. So the first line of the macro is:

> HOM = b6 > ENT > INP > ENT

To accept the FORENAME(S), you must move the cursor down two cells and again await input. That is:

> MCD > MCD > INP > ENT

And this can be repeated for the other three prompts: ADDRESS, TOWN/CITY and POSTCODE. So the five lines that perform the input part of the application are:

```
> HOM = b6 > ENT > INP > ENT
> MCD > MCD > INP > ENT
> MCD > MCD > INP > ENT
> MCD > MCD > INP > ENT
> MCD > MCD > INP > ENT
```

Processing

To move the name and address from column B to row 31, use /Replicate commands. Since these commands make the cursor move about quite a lot, it is a good idea to 'hide' this part of the operation and tell the user what is happening. So enter in the sixth cell of the macro:

**>HID Putting the name and address in the database;
please wait.**

(Be careful not to omit the final \ character.) This blanks the screen entirely and displays the above message in the centre. When you have completed the replications you can cancel the >HID command with a >SHO command.

Before you start replicating, imagine that you already have names and addresses in the database; where are you going to put the new input? If you replicate it into row 31 you will overwrite the details that are already there. Alternatively if you replicate it into the bottom row of the database, you must test each row until you find the first empty one.

In this example, the method you can use is to insert a blank row at the top of the database (row 31), then put the new name and address there. This is why the database must be below the data entry prompts, since otherwise successive row insertions would push the prompts out of position. (Note, however, that when you have protected your macro with a boundary, any row or column manipulations in the visible worksheet will not affect the protected area.)

To move the cursor to row 31 and insert a new blank row, enter:

=b31 > ENT / I > ENT > ENT

(Don't forget to start with a * character, otherwise Superplan will actually move the cursor to cell B31.) Note that the final two > ENT commands select the appropriate /Insert options (see Chapter 1).

The surname must be replicated from cell B6 to cell C31, so the next line of the macro is:

/R > ENTb6,c31 > ENT

(Again, don't forget to start with a * character.) The other parts of the name and address need to be moved from cells B8, B10, B12 and B14 to cells D31, E31, F31 and G31 respectively:

**/R > ENTb8,d31 > ENT
/R > ENTb10,e31 > ENT
/R > ENTb12,f31 > ENT
/R > ENTb14,g31 > ENT**

You can now remove the name and address from the data entry screen. For this, use the /Blank command:

/Bb3:b14> ENT

(The reason for blanking cell B3 will become clear later.)

Continue?

To determine whether the user wishes to enter another name and address, you must display a prompt, then act on the user's response to the prompt. The prompt can be displayed at the top of the existing name and address prompts, in cell A3, for example. First, however, you must cancel the >HID command and ensure that the prompts are on screen:

> HOM> SHO

To display a prompt, enter:

= a3> ENTContinue(Y/N)?> ENT

(This is why column A had to be at least 15 characters wide.) To await the response in cell B3, enter:

> MCR> INP> ENT

(At the end of the replications for the previous name and address this cell must be blank, so that is why cell B3 was blanked together with the name and address cells.)

If the user enters **Y**, the macro must be repeated; if the user enters **N** (or any other character), control should return to the keyboard. The command for testing the user's response is >IFT:

> IFT> CEL="Y"> RUNaa1

/Ba3:b3> ENT> QIT

The >CEL command is used to refer to the current cell, ie cell B3. If the user does not enter **Y**, the **Continue(Y/N)?** prompt and the user's response are blanked before the macro quits, so that the application is ready for the next time anyone wants to use it.

The macro is now complete and should look like this:

	AA	AB	AC	AD	AE	AF
1	>HOM=66>ENT>INP>ENT					
2	>MCD>MCD>INP>ENT					
3	>MCD>MCD>INP>ENT					
4	>MCD>MCD>INP>ENT					
5	>MCD>MCD>INP>ENT					
6	>HID Putting the name and address in the database; please wait.\					
7	=b31>ENT/I>ENT>ENT					
8	/R>ENTb6 c31>ENT					
9	/R>ENTb8 d31>ENT					
10	/R>ENTb10 e31>ENT					
11	/R>ENTb12 f31>ENT					
12	/R>ENTb14 g31>ENT					
13	/Bb3:b14>ENT					
14	>HOM>SHO					
15	=a3>ENTContinue(Y/N)?>ENT					
16	>MCR>INP>ENT					
17	>IFT>CEL="Y"\>RUNaa1					
18	/Ba3:b3>ENT>QIT					
19						

Running the Macro

To run the macro, create an auto using the /Auto Add command and assign it to the CTRL and A keys, for example. The auto need only consist of one command:

>RUNaa1

To run the macro, simply press CTRL and A.

If it works properly, the cursor will move automatically from one prompt to the next, whenever you press A. When you have completed all five prompts, the worksheet will be replaced by the message:

Putting the name and address in the database; please wait.

for a second or two, then the prompts will reappear, together with the message:

Continue(Y/N)?

To test the macro thoroughly, answer Y a few times so that you can enter two or three names and addresses. Then enter N and examine the database to make sure that the names and addresses have been entered properly.

If the macro does not work properly, check that you have entered it as above, or use the /Xecute Step command (see Chapter 1) to go through it one command at a time.

Finally, you should protect your macro using /Xecute Boundary (see Chapter 1) and file the whole worksheet on disk.

Improving the Application

As it stands, the application is a fairly simple method for entering data into a database. But with very little effort, it could be made quite sophisticated.

For example, you could make the macro start automatically whenever anyone loaded the file. To do this, simply name the range in which the macro is entered, START (see the /Name command in Chapter 1). The command is:

```
/NASTART aa1:aa18
```

Then, whenever anyone loaded the file, the prompts would appear on screen with the cursor positioned next to SURNAME:, ready for the first name and address.

To provide some more explanation for your users, you could design a separate screen to appear at the beginning of the application and another to appear at the end. The first screen could display:

This example allows you to enter names and addresses into a database.

To enter the first name and address, press any key.

Then you could use the >KEY command to wait for the user to press a key before the macro displays the name and address prompts.

The final screen could simply display:

The database of names and addresses is in columns C to G, row 31 onwards.

then return control to the keyboard.

To create and display these screens (and the data entry screen), enter each one in a separate part of the worksheet to the right of the macro, then replicate it to the top left of the worksheet whenever you want it displayed. Don't forget to blank the top left of the worksheet before each replication, otherwise you may leave extraneous data on the screen.

To improve the appearance of the application further, you could remove the column and row borders by selecting the appropriate /Global option (see Chapter 1).

If you look again at the macro, you will notice that lines 2 to 5 are the same. Such repetitive sequences of commands can be written in another way using the >INC and >IFT commands. An example has already been given under the description of >INC earlier in this chapter. The alternative commands are:

```
> MCD > MCD > INP > ENT  
> INCae3  
> IFTae3 \ > RUNaa2  
/Bae3 > ENT
```

These perform the first line four times, each time increasing the value of cell AE3 by 1 (it does not matter which cell is used, as long as it is not used for anything else). When AE3 reaches 4, the macro continues, after first blanking AE3 in readiness for the next name and address.

Such repetitive sequences of commands are called loops, and although in this case the number of commands is not reduced significantly, when you need to repeat a large number of commands or perform a loop many times, this technique is indispensable.

Although the application is completely freestanding, you could incorporate it in a much larger application. One way of doing this is to use the >MEN command (see earlier in this chapter). For example, you could have additional macros for displaying names and addresses already on the database and for deleting them. The >MEN command would allow the user to select the appropriate macro in the same way as slash command options are selected.

Alternatively, you could design a menu of your own. For example:

	A	B	C
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

Do you want to:

1. Enter new names and addresses
2. Examine existing names and addresses
3. Delete existing names and addresses
4. Exit to Superplan

Enter a number (1 to 4):

The following commands would then select the appropriate macro:

```
IFTb14=1\>RUNaa1
>IFTb14=2\>RUNba1
>IFTb14=3\>RUNca1
/Ba1:b20>ENT>GIT
```

where the macros for examining and deleting existing names and addresses started in cells BA1 and CA1 respectively. Of course, you would have to ensure that on completion of each macro, the above menu was returned to the screen.

APPENDICES

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APPENDIX A. ERROR MESSAGES

The following is a complete list of Superplan error messages, with their numbers. These numbers can be accessed by the ERR macro command (see Chapter 6).

1 AUTO NOT DEFINED

You have attempted to delete a non-existent auto. See /Auto in Chapter 1.

2 AUTO OR MACRO NESTING LEVEL EXCEEDED

You have used too many levels of nesting when calling autos or macros from other autos or macros. The nesting level limit is 20.

3 CALENDAR NOT DEFINED

No calendar has been defined. To define a calendar see /Calendar Options in Chapter 1.

4 CALENDAR RANGE EXCEEDED

You have attempted to use a date that is beyond the range of the calendar.

5 CAN'T ADJUST CELL REFERENCE WITHOUT WRAP-AROUND

You have attempted to move or replicate an expression such that the cell references now try to refer to cells that are off the edge of the worksheet.

6 CAN'T CHANGE OR DELETE A PROTECTED CELL

You cannot change or delete a protected cell. To unprotect a cell use the /Protect command; see Chapter 1.

7 CAN'T CREATE "to" FILE

Superplan cannot create the file that you want to copy to. This probably means that there is not enough space on your disk.

8 CAN'T FIND/READ THE PRINTER & PLOTTER LIBRARY FILE

The file SP.CAD is not on the expected drive. If the message recurs, the file is corrupt.

9 CAN'T READ/UPDATE SUPERPLAN SYSTEM FILE

A Superplan system file is not on the expected drive. If the message recurs, the file is corrupt.

10 CAN'T READ THE HELP FILE

The file SP.HLP is not on the expected drive. If the message recurs, the file is corrupt.

11 CAN'T START A TIME COMMAND IN NON-EMPTY CELL

You cannot start a time command in a cell that already contains data.

12 CELL NOT LINKED

You cannot load data into a cell from another file unless you have first linked it using /Join Add; see Chapter 1.

13 CIRCULAR REFERENCE/RESULT OUT OF RANGE IN CELL XX

You have entered or created an expression that completes a 'loop' of circular references, or the result of an expression approaches infinity. See the section on Forward and Backward References in Chapter 1.

14 CRITERION FIELD HEADING NOT FOUND IN DATABASE

The criterion field heading must be exactly the same as the equivalent heading in the database. See Chapter 3.

15 DISK ERROR

This message may occur during a /Load or /Save operation for any of the following reasons:

- You have specified an invalid disk drive in your file name
- You have specified a floppy disk drive which is empty
- There is a write protected disk in the drive (/Save only)
- A data error has occurred (ie the disk is corrupt or unformatted)

16 FILE/DEVICE ERROR

This error may occur during a printing or plotting operation for any of the following reasons:

- The printer/plotter is not connected and on-line
- The printer/plotter has run out of paper
- The communications settings on the printer/plotter do not match those of the computer
- For the command /Output Disk, any of the causes of error 15 above may also be applicable

17 FILE NOT FOUND

The filename you have specified is not on the specified drive. You have either typed the name wrongly or specified the wrong drive.

18 FILE NOT FOUND OR DUPLICATE FILE NAME

In a rename operation, either the 'from' file does not exist on the specified drive, or the 'to' file already exists.

19 INSUFFICIENT FILE SPACE

There is not enough room on the disk for the file you want to create. Specify another drive or delete some expendable files.

20 INSUFFICIENT MEMORY

There is not enough memory left in your computer to perform the required operation.

21 INVALID AUTO KEY

You have entered an invalid auto key during a /Auto Edit command. See /Auto in Chapter 1.

22 INVALID AUTO OR MACRO COMMAND

An auto or macro command is not in the correct format.

23 INVALID COLUMN

You have not entered a valid column letter.

24 INVALID COORDINATE

You have not entered a valid coordinate.

25 INVALID CURSOR POSITION

In a = Goto operation, you have specified a cell reference that is not on the worksheet.

26 INVALID DATE

The date you have entered is not in the correct format.

27 INVALID DRIVE CODE

The drive code you have specified is not in the correct format or is not available on your system.

28 INVALID FILE NAME

The filename you have entered is not in the correct format.

29 INVALID FILE PATTERN

The file specification you have entered is not in the correct format.

30 INVALID FILE TYPE

The file type you have entered is not in the correct format or is incompatible with the type of file you have already specified.

31 INVALID "from" COORDINATE

32 INVALID "to" COORDINATE

You have made a mistake in specifying one of the cell references or ranges in a /Replicate command. See Chapter 1.

34 INVALID "from" FILE

35 INVALID "to" FILE

One of the filenames in a /Utilities Copy or Rename command is not in the correct format. See Chapter 1.

35 INVALID GRAPH COMMAND

You have made a mistake in entering a graph command. It has been entered as a piece of text. See Chapter 4.

36 INVALID GRAPH DATA RANGE

The STA graph command appears after the END graph command. See Chapter 4.

37 INVALID LINK RANGE

You have made a mistake in entering a link range. See /Join in Chapter 1.

38 INVALID NAME

You have made a mistake in entering a name. See /Name in Chapter 1.

39 INVALID NUMBER

You have made a mistake in entering a number. It has been entered as a piece of text. See Chapter 1.

40 INVALID NUMBER OR EXPRESSION

You have made a mistake in entering a number or expression. It has been entered as a piece of text. See Chapter 1.

41 INVALID OPTION

You have attempted to select an option that is not available.

42 INVALID PASSWORD

The password you have specified during a /Xecute Boundary operation is incorrect.

43 INVALID RANGE

You have made a mistake in entering a cell range.

44 INVALID ROW

You have not entered a valid row number.

45 INVALID TIME COMMAND

You have made a mistake in entering a time command. It has been entered as a piece of text. See Chapter 2.

46 INVALID UPPER/LOWER DATA RANGE

You have made a mistake in specifying the upper and lower limits for a graph. See Chapter 4.

47 LINKED NAME NOT FOUND

You have entered a link name in a /Join command which has not been defined for the file you are trying to link. See /Join and /Name in Chapter 1.

48 MACHINE DEPENDENT ERROR

This error occurs when your computer is in some way inadequate for running Superplan.

49 MAXIMUM COLUMN EXCEEDED**50 MAXIMUM ROW EXCEEDED**

You cannot use columns or rows which are outside the worksheet.

51 NO COLOUR SCREEN CONFIGURED

You have attempted to set up colour attributes using the /Format Options command, but have not configured a colour screen. Use the /View Options command to do so (see Chapter 1).

52 NO GRAPHICS SCREEN CONFIGURED

You have attempted to view a graph on screen without specifying a screen. See /View Options in Chapter 1.

53 NO PLOTTER CONFIGURED

You have attempted to draw a graph without specifying a plotter. See /View Options in Chapter 1.

54 NO PREVIOUS RECORDS SELECTED

You have attempted to perform a /Table Query Last find command, but the last /Table Query Find operation did not select any records. See Chapter 3.

55 NO PRINTER CONFIGURED

You have attempted to print a report or graph without specifying a printer. See /Output Configure and /View Options in Chapter 1.

56 NO RECORDS FOUND

A database selection operation has not found any records that satisfy the specified criteria. See Chapter 3.

57 NO VALID GRAPH COMMANDS

You have attempted to view, draw or print a graph, but your worksheet or current graphics range does not contain any valid graph commands. See Chapter 4 and /View in Chapter 1.

58 OPERATION CANCELLED

The current operation has been cancelled.

59 OUTPUT FIELD HEADING NOT FOUND IN DATABASE

The output field heading must be exactly the same as the equivalent heading in the database. See Chapter 3.

60 PLOTTER INITIALISATION ERROR

An error has occurred while Superplan was attempting to initialise your plotter. Check your configuration under /View Options; see Chapter 1.

61 PRINTER CONFIGURED FOR TEXT ONLY

You cannot use the current printer for drawing graphs, or for rotated output.

62 PRINTER INITIALISATION ERROR

An error has occurred while Superplan was attempting to initialise your printer. Check your configuration under /Output Configure and /View Options; see Chapter 1.

63 SCREEN INITIALISATION ERROR

An error has occurred while Superplan was attempting to initialise your screen. Check your configuration under /View Options; see Chapter 1.

64 WARNING: UNSTABLE TIME COMMAND

The expressions in this time command are constructed in such a way that they may cause unexpected results.

65 INTERNAL ERROR: DIVIDE BY ZERO

Normally occurs when viewing graphs. (This may be rectified by changing the ACX or ACY commands.)

APPENDIX B. SUPERPLAN AND 1-2-3 OPERATORS AND FUNCTIONS

The following table lists all the Superplan operators and functions, and their equivalents in Lotus 1-2-3. Functions that do not have any direct equivalents are loaded into the Superplan worksheet as text.

Superplan	Lotus 1-2-3
^	up-arrow
*	*
/	/
+	+
-	-
=	=
<>	<>
<	<
>	>
< =	< =
> =	> =
ABS	@ABS
ACOS	@ACOS
AFTER	
AND	AND
ASIN	@ASIN
ATAN	@ATAN
AVG	@AVG
CHOOSE	@CHOOSE
COL	
COS	@COS
COSH	
COUNT	@COUNT
DATE	
DAVG	@DAVG
DAY	
DCOUNT	@DCOUNT
DEG	
DMAX	@DMAX
DMIN	@DMIN
DOM	
DOMOY	
DOW	
DSUM	@DSUM
E	
END	
ERR	@ERR

Superplan	Lotus 1-2-3
EXP	@EXP
FALSE	@FALSE
FLOAT	
FV	@FV
IF	@IF
INT	@INT
IRR	@IRR
ISERR	@ISERR
ISNA	@ISNA
JDATE	
JDAY	
JNAME	
LENGTH	
LN	@LN
LOG	@LOG
LOOKUP	
MAX	@MAX
MIN	@MIN
MON	
MONTH	
MOY	
NA	@NA
NCOL	
NDAY	
NOT	NOT
NPV	@NPV
OR	OR
PI	@PI
PMT	@PMT
PV	@PV
RAD	
RAND	@RAND
ROUND	@ROUN
ROW	
SIN	@SIN
SINH	
SQRT	@SQRT
START	
SUM	@SUM
TAN	@TAN
TANH	
TELTIM	
TIME	
TOD	
TODAY	

Superplan

Lotus 1-2-3

TRUE
YEAR

@TRUE

APPENDIX C. REDEFINING THE MENUS

The Superplan menus are defined as a set of autos which are stored in the SP.MNU file on the program disk. When you start up Superplan it automatically loads this file into memory and sets up the menus according to the auto definitions contained in the file.

This feature allows you to redefine the menus. SP.MNU is an ASCII text file and by editing it in a wordprocessor or a text editor, you can replace some or all of the existing menus with your own autos.

However, the information in the file follows a strict format. If you make a mistake in editing it, the results are unpredictable. Loading an SP.MNU file in which the information is stored in the wrong sequence, for example, may prevent Superplan from operating correctly.

If you wish to redefine the menus, it is important therefore that the first thing you do is make a copy of the SP.MNU file. Either copy it to another disk, or use the AmigaDOS command Rename to change its name. This way, you can restore the original menu definitions if anything goes wrong.

The SP.MNU file gives you complete control over the Superplan menus. You may alter any of the following features:

- Menu headings
- Menu options
- Sub-menus
- The number of options in a menu

Each of these features must be defined on a separate line and in the correct order. Lines beginning with a colon are treated as comments and are ignored. The comments in the existing file will give you a good idea of the correct format, and you are advised to read these before making any changes.

Apart from the comments, the first line should specify the number of menus. For each menu starting with the leftmost menu, you must then enter the following information:

1. The text string in quotation marks for the menu heading.
2. The number of options in the menu.
3. The text strings to define the options. These have the format: "Auto label","auto command". For example, the line which defines the Copy option is: "Copy /rr,"/rr"
4. If you want to define an option with sub-menus, replace the "auto command" string with "...". The number of options in the sub-menu must be specified on the line preceding the text string for the options themselves.

Remember that each of the items in this list must be entered on a separate line.



GLOSSARY

Absolute cell reference: A cell reference that remains exactly the same, even when the expression in which it is contained is moved or copied to another cell. To be absolute, a cell reference must be in upper case and the /Global option Adjust lower case cell references only must be in force.

Annotation: A piece of text displayed at a specified position on a graph.

Area graph: A form of line graph designed to accumulate successive data values. It is like a line graph version of a stacked bar chart.

Argument: Information provided to a function. Arguments for a function are separated by commas and enclosed by parentheses.

Arithmetic operator: A symbol representing an arithmetic calculation.

Arrow keys: The ←, →, ↑ and ↓ keys used to move the cell cursor, the command option cursor and the entry line cursor, and to edit the entry line.

Auto: A sequence of commands and data entries defined by the /Auto command to be assigned to a particular key.

Axes-type graph: A graph in which data points are defined by the points of reference on X and Y axes.

Axis: A horizontal or vertical line drawn on a graph to define points of reference.

BACKSPACE: The key that is used to delete the character to the left of the cursor position.

Backward reference: A reference to a cell which will be calculated before the cell containing the reference.

Bar chart: A form of graph in which numeric values are represented by horizontal or vertical rectangles.

Blank: To use the /Blank command to delete the contents of a cell or cell block.

Border: The column border contains the column letters along the top of the screen. The row border contains the row numbers down the left-hand side of the screen. Both borders can be suppressed by a /Global option.

Calendar: The calendar defined by the /Calendar command to give dates and/or times to columns of a timesheet.

Cell: The intersection of a column and row forming a space into which you can enter data.

Cell block: A rectangular block of two or more cells.

Cell block name: A name defined by the /Name command to identify a cell block.

Cell contents: The data that a cell contains.

Cell cursor: The highlighting used to identify the cell with which you are currently concerned.

Cell name: A name defined by the /Name command to identify a cell.

Cell range: Two cell references separated by a period or colon, defining a cell block. The first reference must be to the cell in one corner of the block; the second reference to the cell in the diagonally opposite corner.

Cell reference: The column letter and row number of a cell.

Cell value: The value of the cell contents.

Column: A vertical stack of 2048 cells.

Column width: The maximum number of characters that can be displayed in one cell of the column.

Configure: To tell Superplan about the various characteristics of a connected device, so that Superplan can communicate with it.

Consolidate: To use the /Join command to combine data from two or more worksheets.

Copy: To use the /Utilities Copy command to make a copy of a disk file.

Criterion range: The range of the cell block containing the field names and criteria used by the /Table Query or Load command or database functions to select records from a database.

Critical path: The jobs on which the timely completion of a project depend; it is displayed by the /Kritical command.

Critical path analysis: A method of establishing the minimum completion time for a project and of identifying all the jobs that cannot be extended or delayed without affecting this completion time.

Current cell: The cell highlighted by the cell cursor.

Current column: The column in which the current cell lies.

Current critical path range: The most recently defined cell block in which the /Kritical command is to look for the critical path.

Current file: The last file used in a disk file operation.

Current graphics range: The most recently defined cell block in which the /View command is to look for graph commands.

Current row: The row in which the current cell lies.

Current worksheet: The worksheet currently displayed on the screen.

Database: A collection of similar types of information organised in the form of a table.

Data management: The process of creating and maintaining a database.

Data point: The point on an axes-type graph representing a numeric value in a graph command.

Date value: The value entered into a cell by one of the calendar functions.

Default: The value that Superplan uses unless you specify otherwise.

Delete: 1, To remove one or more rows or columns from the worksheet using the /Delete command. 2, To remove a file from a disk.

DELETE: The key used to erase characters from the entry line.

Directory: The list of filenames on a disk; displayed by the *F2* FILES key or /Utilities Directory command.

Edit: To change the contents of a cell.

END: This button on the Control Panel moves the cursor to the cell at the intersection of the right-most non-empty column and the lowest non-empty row.

Enter: To type data into the entry line.

Entry: Data typed into the entry line.

Entry line: The bottom line of the screen; used to display data and commands as they are entered.

Entry line cursor: The highlighting that indicates where the next character on the entry line will appear.

Error message: A message that appears on the status line, indicating that you have made a mistake in issuing a command or entering data.

Error value: A value obtained when an expression cannot be calculated; displays as ERR.

ESC: This key cancels the current slash command or current data entry.

Exponential display: A format that displays a number in scientific notation. Numbers are displayed so that the decimal point is immediately after the first digit; the number is then raised to the appropriate power of 10. For example, 5.213E4 is the exponential display format for 52,130.

Expression: A formula for calculating a value.

Field: 1, A column of a database. 2, A single cell in a database. 3, A cell or cell block in a /Format command.

Field name: The text in the cell at the top of a column of a database.

Field offset: The identification of a database field expressed in terms of its position: the leftmost field has an offset of 0, the next field an offset of 1, the next field an offset of 2, and so on.

Float: 'Free float' is the amount of time by which a job can be delayed or extended before it affects the start of the next dependent job. 'Total float' is the amount of time by which a job can be delayed or extended before it affects the completion date of the project.

Font: A particular typeface used for printing, plotting or displaying characters on a wordslide or graph.

Footnote: A piece of text displayed at the bottom of a graph.

Format: 1, To use the /Format command to define the visual appearance of the value of a cell, block, row, or column, or the entire worksheet. 2, To prepare a blank disk for use.

Forward reference: A reference to a cell which will be calculated **after** the cell containing the reference.

Function: A 'ready-made' expression.

Function call: A function name, followed by an open parenthesis, followed by one or more arguments separated by commas, ended by a close parenthesis.

Gantt chart: A form of graph in which jobs are represented by bars on a calendar.

Global option: An option set by Superplan or changed by the /Global command that affects the entire worksheet.

Graph: A diagrammatic representation of data.

Graph command: A data entry (preceded by a comma) that defines a particular aspect of a graph.

Grid: A set of horizontal or vertical lines drawn through a graph to emphasise the points of reference on an axis.

HOME: This button on the Control Panel moves the cursor to the top left-hand cell of the worksheet.

Input range: The cell range defining the part of a database that is to be acted on by a /Table Query command or database function.

Insert: To use the /Insert command to put in one or more empty rows or columns at a particular position of the worksheet.

Job: An activity with a name and a length, and an optional start date and resource; defined by a time command.

Job dependency: The relationship(s) a job has with other jobs or with other data in the worksheet.

Join: To use the /Join command to copy data from a worksheet file into the current worksheet.

Jump: To use the ; key to move the cursor from one split window to the other.

Justification: 1, Aligning a cell display to the left, right or centre of the cell. 2, Aligning graphics text to the left, to the right, or on either side, of a specified point.

Legend: The names and graphical representations identifying the sets of data used in a graph.

Line graph: An axes-type graph in which data points are joined by a line.

Load: To transfer a file from disk onto the worksheet using the /Load or /Table Load command.

Logical operator: A symbol that defines a relationship between two expressions which is either true or false.

Move: To use the /Move command to transfer the current row or column to another position in the worksheet.

Name: A string of characters defined by the /Name command to identify a cell or cell block.

Natural order: To recalculate the expressions in the worksheet in the order implied by their cell references.

Not available value: A value obtained when data is not available; displays as N/A.

Number: Superplan treats a number as a particular kind of expression.

Numeric value: A value that can be expressed as a number. It can be entered directly as a number or obtained by evaluating an expression.

Output: To use the /Output command to put worksheet data in a disk file or print it on a printer.

Output range: The range defining the part of the worksheet where records and fields selected from a database are copied by the /Table Query or Load command.

Partial column: A cell block lying within part of a single column.

Partial row: A cell block lying along part of a single row.

Pie chart: A form of graph representing numeric values as segments of a circle.

Plot: To draw a graph on a plotter.

Plotter: A device that uses coloured pens to draw graphs and text.

Pointing: A method of putting cell references on the entry line by moving the cursor to the appropriate cells.

Prompt: A message asking you to input data or select a command or option.

Prompt line: The line of the screen on which a prompt appears.

Protect: To use the /Protect command to prevent a cell or cells from being changed.

Query: To use the /Table Query command to select, identify or delete records from a database according to specified criteria.

Quit: To use the /Quit command to exit from Superplan and return to the operating system.

Recalculate: To evaluate all the expressions in the worksheet. This may be done automatically by setting the /Global option 'Automatic recalculation', or manually by pressing F3 or the ! key or the ! button.

Record: A single row of a database.

Relative cell reference: A cell reference that is adjusted to reflect the new position of the expression in which it is contained, when that expression is moved or copied to another cell. A relative cell reference must usually be in lower case, though it can be in upper case if the /Global option 'Adjust all cell references' is in force.

Repeated text: A character that is repeated from the cell in which it is entered along the entire row to the right-hand edge of the worksheet or to the first non-empty cell, whichever comes first.

Replicate: To use the /Replicate command to make one or more copies of the contents of a cell or cell block in another part of the worksheet.

Row: A horizontal line of 1024 cells.

Running heading: The row(s) printed at the top of each page when a worksheet is printed by the /Output command.

Save: To use the /Save command to transfer the current worksheet to a disk file.

Scattergram: An axes-type graph in which data points are indicated by a scatter marker.

Scatter marker: A character or symbol used to identify data points on a scattergram.

Scroll: To move the window up, down or across the worksheet.

Slash command: An instruction to Superplan to perform a particular operation.

Split window: The /Window command can divide the display vertically or horizontally into two windows.

Spread graph: An axes-type graph in which each data point has a high value and a low value joined together by a line or a bar.

Spreadsheet: In general, a use of the worksheet to perform numerical or financial calculations.

Status line: The fourth line from the bottom of the screen; used to show the status of the current cell, error messages, current filenames, graphics ranges, critical path ranges, etc.

Step graph: An axes-type graph in which data points are joined by a stepped line.

Tab: A position on a wordslide at which text entered in a particular cell of a WRD graph command is displayed.

Tick: 1, One of the short lines indicating the reference points on X and Y axes.
2, One of the short lines indicating a data point on a tick left or tick right graph.

Tick graph: An axes-type graph in which data points are indicated by a short line to the right or left of each data point.

Time command: An entry consisting of a < character, followed by a job name and length, and an optional start column and row, defining a job in a timesheet.

Timesheet: In general, a use of the worksheet to display jobs on a calendar.

Title: The text used as a heading for a graph.

Trigger: A line across a Gantt chart emphasising a particular date, or a line across a bar chart or area graph relative to which data points are displayed.

Unprotect: To use the /Protect command to remove protection from a cell or cell block.

View: To use the /View command to see a graph on screen, print it on a printer or plot it on a plotter.

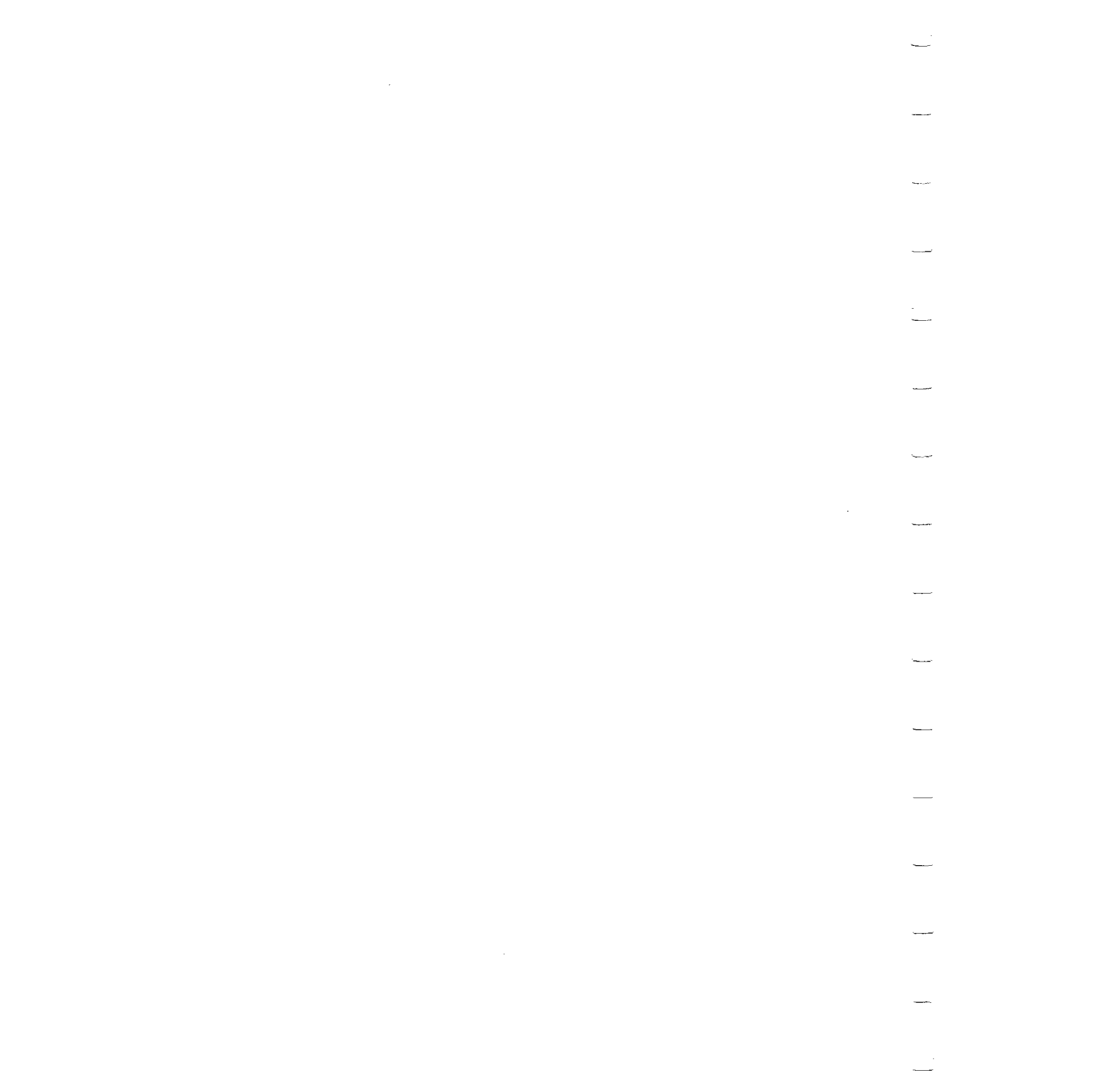
Window: The part of the worksheet currently displayed on the screen.

Wordslide: Free format text created by WRD or ANN graph commands.

X axis: The horizontal axis of an axes-type graph.

Y axis: The vertical axis of an axes-type graph.

Zap: To use the /Zap command to clear the current worksheet of all data.



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